THE IRON AGE

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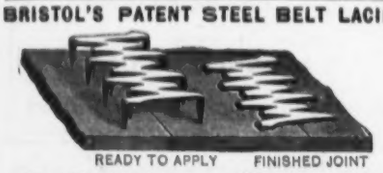

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THE IRON AGE

New York, Thursday, October 8, 1908.

A 1908 IRON ORE HANDLING PLANT.

The New Hulett Machines at Central Furnaces, Cleveland, Ohio.

BY WALTER G. STEPHAN.

Each succeeding year seems to record at least one new plant for the unloading of iron ore from lake boats, and each new plant seems to surpass all previous installations in one or more important points. The present year is no exception, notwithstanding the lull in the ore carrying trade, as it has already witnessed the starting of two splendid new ore handling plants—one at Gary, Ind., and one at the Central Furnaces of the American Steel & Wire Company, at Cleveland, Ohio. The latter is the subject of this article. These new machines are all the more interesting because they stand beside several of the old type of ore unloaders which have done excellent service in the past, and which are equipped with the old style dump bucket. The contrast is very striking, and makes the mammoth new ore machinery stand out in bold relief. The little mouthful of ore which the dump bucket brings up from the hold seems scarcely worth while when compared with the ten-ton grab made by the Hulett automatic bucket. One cannot watch these huge steel birds, dipping their bills down into the hold of a boat without marveling at the genius and daring of the inventor of such a monster machine. To be sure, it is not a very graceful looking bird, but, as the steel man says, "it delivers the goods," and that is his first and last demand.

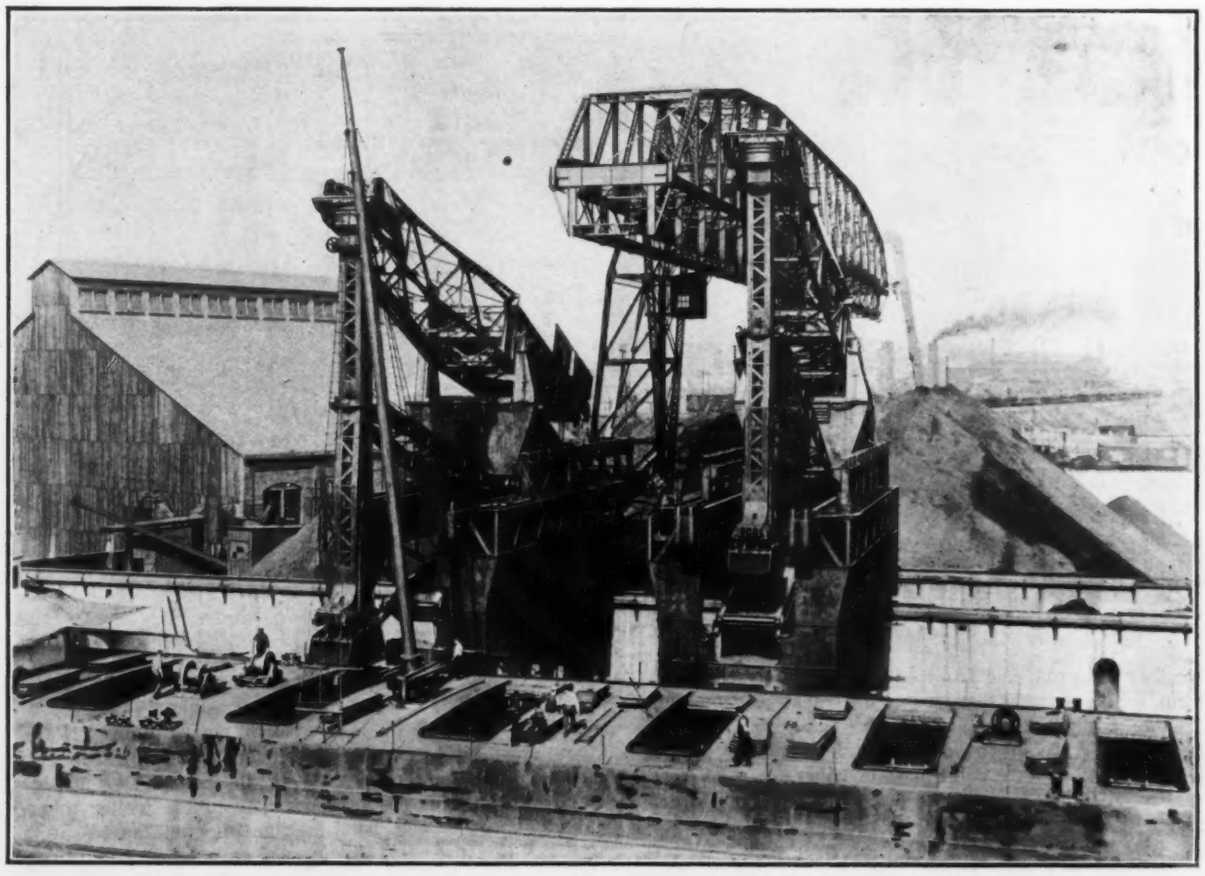


Fig. 1.—Hulett Ore Unloading Machines and Ore Stocking Bridge at Central Furnaces of the American Steel & Wire Company, Cleveland, Ohio.

This new plant of the Central Furnaces, of which an excellent photographic view is given in Fig. 1, and a sectional elevation in Fig. 2, was designed and built by the Wellman-Seaver-Morgan Company, Cleveland, and was first started in operation in August of this year. It consists of two 10-ton Hulett automatic electric ore unloaders and one electrically operated ore handling bridge of 10 tons capacity. It was designed to unload ore from the holds of lake vessels and to discharge it by means of conveyer cars either into cars for direct shipment to the company's Newburg blast furnaces, or into a temporary storage bin located under the cantilevers at the rear of the unloaders. Weighing hoppers are provided for weighing the ore which is delivered to cars for direct shipment.

At the rear of the unloaders and running on two double tracks parallel with the dock face, is located a rehandling and stocking bridge, which is used to rehandle the ore from the temporary stock pile and place it in the main storage pile under the central span, or to reclaim the ore from stock and load it on cars standing upon the two rear tracks under the unloaders.

The Hulett Automatic Unloaders.

The two unloaders are of the usual Hulett type, consisting of two main plate girders running at right angles to the dock and mounted on a front and rear leg. Each leg is supported on two four-wheel equalized trucks, all of them being driven in the customary manner by bevel gearing and shafting from the machinery house on the rear leg. On top of each main girder are two parallel rails on which the trolley travels back and forth, supporting on top of its posts the huge walking beam with

swiveling bucket leg at the front end. The bucket is of the Hulett type and is of 10 tons capacity. It is operated by a man stationed in the lower end of the bucket leg, who controls all the movements of the bucket, walking beam and trolley. Located, as he is, directly above the bucket shells, he can guide the bucket into the hatches and hold of the boat, with remarkable ease and precision. It is a decidedly novel sensation to be carried out over the water and into the hold of a boat on such a powerful machine, and it is not at all surprising that operators were very reluctatnt about "taking the job" when the first Hulett machine was installed at Conneaut years ago.

The bucket dumps its load into a conveyor car held at the front end of the machine and having a capacity somewhat in excess of ten tons. While the bucket returns to the hold for another bite, the conveyor car is run back on tracks, held underneath the main girders, to the desired dumping position. This car is arranged so that it can be dumped at any desired point along the track, either into cars direct or into the weighing hoppers at the rear leg, or into the temporary storage bin at the rear of the unloader and under the cantilever extension of the bridge.

The front legs of the unloaders travel on double tracks at the extreme front of the dock and on the dock level, while the rear legs travel on tracks laid on top of a long concrete pier, about 12 ft. above the dock level. The face of the dock, which supports the front legs, is made up of a solid mass of concrete set on top of timber piles. The unloaders will span four standard gauge tracks, of which the two front tracks are used for loading direct, while the rear two will be directly underneath the two 15-ton weighing hoppers. These weighing hoppers are of an entirely new design, and consist of the usual tapering rectangular steel plate hopper at the base of which is pivoted an eccentric horizontal rotating disk with a stationary plow, which scrapes off the ore into the car when the disk is rotated by means of a small motor and gearing at the side. The hopper is suspended from levers connected to a standard scale, the beam box being placed in the machinery house, conveniently located at one side.

Two operators are required on the unloader proper, one stationed in the bucket leg, who controls all the bucket, walking beam and trolley motions, and one stationed in the machinery house at the rear leg, who controls the operation of the bucket car and also the longitudinal travel of the machine. In addition to these, a weighman will be required to operate the recording scale and gates, and also an extra man as oiler for both unloaders.

The unloaders are designed to travel longitudinally along the dock at a speed of 100 ft. per minute, and this speed is maintained by a 100 hp. motor. The conveyor car is designed for especially severe usage, and travels back and forth at a maximum speed of 300 ft. per minute. All the movements of the machine are so designed that a complete cycle in continual operation can be made in 50 seconds.

All of the trucks are provided with ball and socket joints, and expansion joints are also provided, so as to give flexibility and to provide for slight unevenness of the tracks. All wheels are double flanged cast steel, and all gearing on the trucks is steel.

Power for Bucket and Walking Beam Motions.

For closing and opening the bucket, a 75-hp. motor-driven drum on the walking beam is used, which winds and unwinds two steel cables running to the bucket leg mechanism. The trolley is traveled back and forth by means of cast racks and pinions driven by a 50-hp. geared motor on the trolley. The racks are bolted to the top of the main girders between the double rail tracks. The trolley motor is supplied with automatic cutouts and slowdowns to prevent the trolley from overrunning at either end of its travel. The cutouts are entirely independent of the operator, and make the operation of the trolley as nearly "fool proof" as possible.

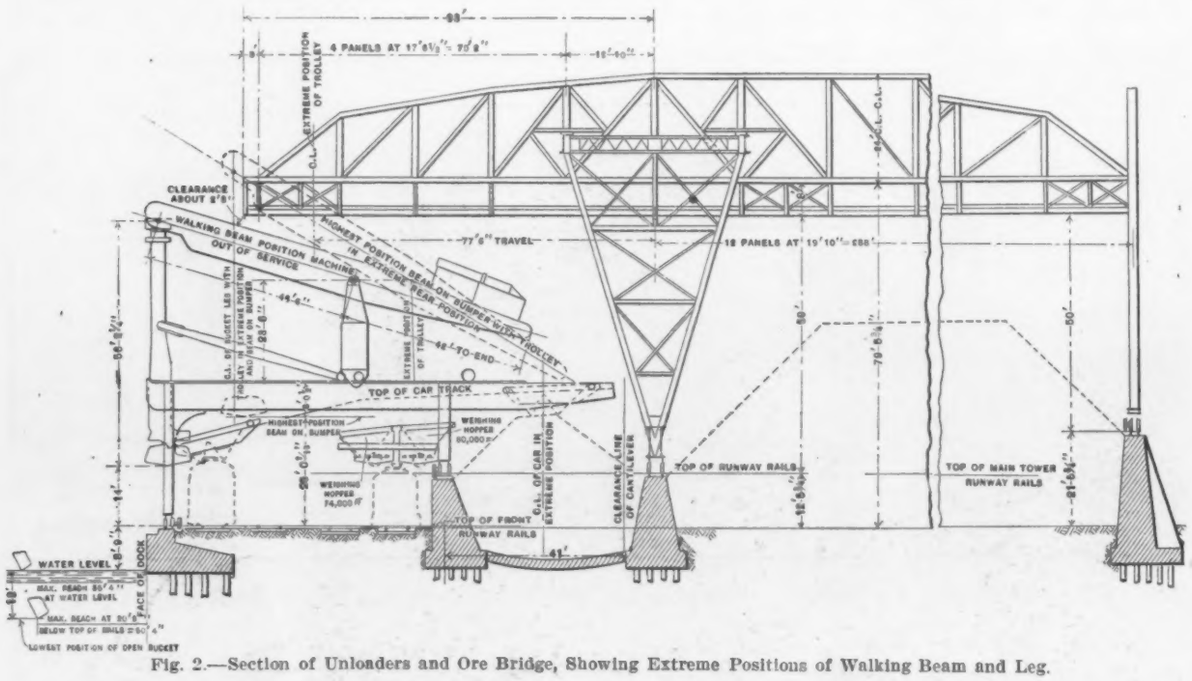


Fig. 2.—Section of Unloaders and Ore Bridge, Showing Extreme Positions of Walking Beam and Leg.

The walking beam is hoisted by means of four 1⅛-in. plow steel cables, which are wound up in pairs on two cast steel drums at the rear of the beam. One 150-hp. motor is used for this purpose. As in the trolley movement, so in the beam hoist mechanism, cutouts and safety latches are provided to prevent accidents from over-travel or breakage of cables. The safety latches are very similar to the ordinary door latch, and only come into operation just before the beam strikes the bumpers.

High Capacity Conditions.

Each unloader has a capacity considerably in excess of 250 tons per hour for continuous running, with the help of eight shovelers in the hold of the boat. However, shovelers are not required until 70 per cent of the cargo has been unloaded automatically. The buckets have such a reach (and can be turned to any angle) that they can cover more than half the distance between two hatches, 24 ft. center to center. The conduit rails for supplying current to the machines are mounted on brackets fastened to the face of the pier supporting the rear legs and tracks.

The Ten-Ton Rehandling Bridge.

At the rear of the unloaders, and with its cantilever projecting over them is the 10-ton rehandling bridge, which is shown in all its graceful outlines in Fig. 3.

It is very simple, yet appeals to the eye of anyone who appreciates beauty in a structural design. The notable feature is the inverted A-shaped tower, which at first seems a very unstable support, when it is remembered that the shear leg suspension is by tension rods only. This type of tower was adopted because of its greater economy of dock space and its peculiar adaptability to the shape of the unloaders. The bridge proper is made up of two double riveted trusses supported on a tower at the water end, and a shear leg at the other. The tower travels on double tracks laid on top of a concrete pier about 12 ft. above the dock level, while the shear leg travels on top of a concrete pier about 21 ft. above the dock level.

The bridge trusses are horizontal, and the main span is 238 ft. At the water end and overhanging the unloaders is a cantilever extension of 93 ft., which allows the bucket on the bridge to load on the two rear tracks spanned by the unloaders. The other end of the trusses is made such that a cantilever extension can be added whenever this is desirable. As previously stated, the trusses are supported at the shear leg by tension bars, this construction giving flexibility to the structure, allowing the bridge to accommodate itself to unevenness in the runway without straining any members. The trolley track is suspended from the bridge trusses, and consists of I-beam stringers, on top of which are fastened the trolley rails. The trolley contains all of the machinery for operating the bucket and trolley, and is controlled by one operator, who rides upon it. The bucket is a standard Hulett 10-ton excavating bucket, operated by two hoist and two hold cables. The entire bridge mechanism is designed to handle this 10-ton bucket loaded at the following speeds: Hoisting, 175 ft. per minute; trolley travel, 600 ft. per minute; bridge travel, 75 ft. per minute.

The main tower is supported on two eight-wheel equalized trucks of special construction, with ball and socket joints, and also with special provision for taking the longitudinal thrust of the bridge. Four wheels in each truck are driven through bevel gears, shafting and universal couplings, which connect with the usual longitudinal bridge shaft running from tower to shear leg. The shear leg is supported on two four-wheel ball and socket equalized trucks, both of which are driven. The moving motor is located on the bridge just above the tower, and is a 150-hp. mill type machine. A heavy band brake is supplied on the longitudinal bridge shaft, which is controlled by a foot lever on a platform below within easy access of the man on the trolley, who steps from his trolley to the platform when he wishes to move the whole bridge. This brake is so designed that it is sufficiently strong to skid the wheels of the trucks, and is set at all times by a weight, except when the operator has his foot on the releasing lever. The rail clamps (of which there are two, one at each leg,) are very simple, yet interesting. They consist of two steel spuds hinged underneath the truck girders, and each pointing toward one of the trucks. These spuds have sharpened steel points, and they are raised and lowered onto the concrete tracks and ties between the runway rails by means of a hand wheel and chains. Before the bridge could possibly start to run away, with these rail clamps dropped on the runway, either the spuds would have to be broken or else the entire tower would have to be lifted off the track.

The Trolley.

The trolley consists of a built up structural frame mounted on eight wheels, whose load is equalized by springs over each bearing. Each set of wheels is driven by a 50-hp. motor, and is provided with powerful friction brakes operated by air cylinders in the cab. The bucket operating mechanism consists of two cast steel drums, each geared to a 200-hp. mill motor. One drum is for the two hoist cables, and one for the two hold cables. The hoist and hold motors are each provided with a solenoid brake, which is a safety brake to prevent dropping the load in case the current should ever be cut out. The hold rope drum is also provided with a friction band brake of sufficient size to hold the bucket in dumping its load. This is operated by air.

However, for the regular handling of the bucket, the above mentioned safety brakes are not used, because the motors are designed for dynamic braking. The shunt windings are such that these motors build up promptly as generators, and lower the bucket under perfect control without the use of any friction surfaces. The bucket can be lowered either closed, one-fourth open, one-half open, or in any position desired by the operator with equal ease. The operator can sit down to his work and operate the bucket by means of two controllers. The electrical equalizations of the loads on the hoist and hold motors is such that it keeps the cables taut at all times. On account of the spring equalization of the trolley tracks, the trolley rides very easily, and the passage of the wheels over the track joints is scarcely felt in the cab.

In the cab is located a small air compressor and tank to supply compressed air for the operation of the air brakes, very similar to the usual street car air braking system.

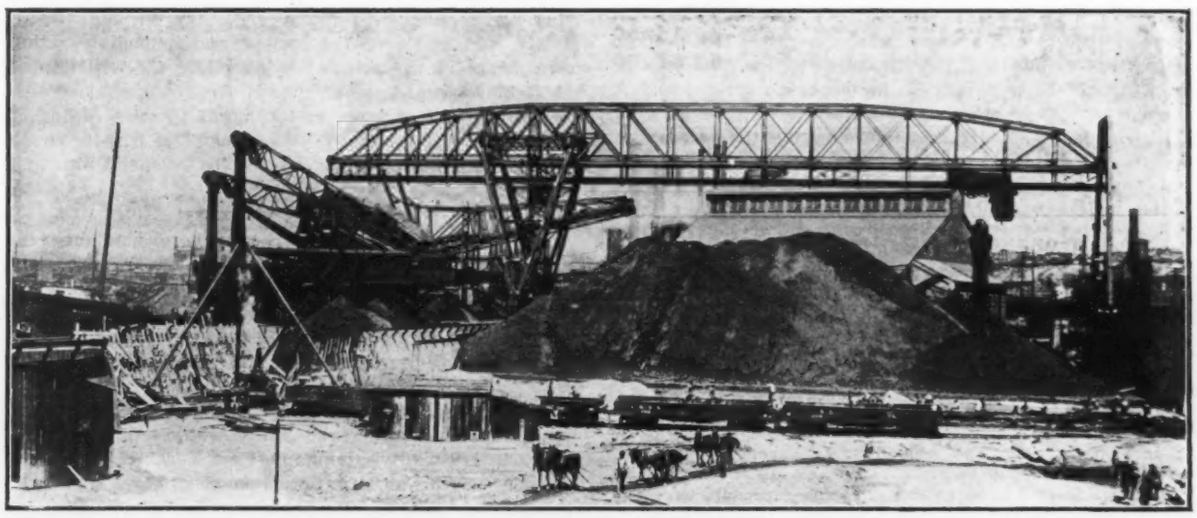


Fig. 3.—A View of the Ore Handling Bridge, Stock Pile and Trough for Temporary Storage of Ore.

The second annual convention of the American Peat Society will be held at the Charles Hotel, Toledo, Ohio, October 22, 23 and 24. Papers will be presented on peat gasifying, peat coking, peat drying, alcohol and ammonia from peat, and the commercial outlook of the present peat industry. Julius Bordollo, Kingsbridge, N. Y., is secretary.

James B. Hardie and James K. Lyons, who recently organized the Gas Power Engineering Company, have established an office at 1113 Empire Building, Pittsburgh, and will contract for and equip open hearth plants with gas producers and power plants for the use of gas.

The Railway Business Association.

Supply Manufacturers Organize to Combat Adverse Criticism of Railroads.

Representatives of manufacturers of railroad material and equipment numbering more than 100 met at the Waldorf-Astoria, New York, on the afternoon and evening of September 30, and formed the Railway Business Association, the avowed purpose of which is to combat adverse and unfair public criticism against the railroads of the country. Leaders in the movement frankly admitted that they were prompted to take action because of the fact that railroad business has fallen off to an alarming extent, which is largely due, they declare, to public clamor against the railroads and consequent unfair legislation. As Colonel George A. Post, president of the Standard Coupler Company, who was afterward elected president of the organization, aptly put it, the movement was a declaration of war against "the devastating attacks of predatory wrath upon the railroads."

The companies represented at the meeting comprised a majority of the most important manufacturers in the country catering to railroad needs in the way of supplies and equipment, and since the movement has gained publicity new applications for membership in the organization have been coming in from all parts of the country. Besides electing officers and an executive committee, the meeting subscribed funds to enable the body to open offices and take whatever steps may be necessary to bring about a change in the present railroad situation. This may be done through publicity and in combating the utterances and movements of politicians who, as one speaker said, "in order to obtain public applause advocate unfair legislation against the railroads."

Why the Organization is Formed.

In opening the meeting, Colonel Post was made chairman by acclamation, and at the outset he stated the situation which prompted the forming of the organization, as follows:

This assemblage represents a vast amount of invested capital, to which a great army of American artisans look for remunerative employment. Whether the capital so invested shall yield profitable returns to the investors who venture their money therein and whether the labor of workingmen shall be in demand in our plants so that full wages may be earned by them depend entirely upon the measure of prosperity enjoyed by our railroads.

We all know too well what the conditions have been for long months past. Locomotives and cars have been idle by the thousands, and railroad earnings have shrunken to an appalling degree. There has ensued a shutting down of shops, throwing out of employment an army of mechanics; laying off of train crews and other employees, and almost an absolute cessation of the purchase of materials. This has had its disastrous reflex, of course, in our operations, and the ramifications of distress have been widespread.

When railroads are prosperous, times are good everywhere; when railroads are not prosperous, jobless hordes are in despair, and the cupboards of workingmen are bare. Largely responsible for this paralysis afflicting our railroads is the attitude of harsh hostility toward them, as manifested in Federal and State administrative and legislative circles. Because of this hostility, confidence of investors in their prospective profitable operations and in the stability of values of their securities has been seriously undermined.

Those who depend upon railroads for subsistence, directly or indirectly, must be loyal to their means of support and quick to resent interference therewith by crafty or turbulent trouble makers.

Railroads must be operated with a fair margin of profit, else they cannot maintain efficiency in equipment, adequately meet increasing demands for terminal facilities and other betterments, nor can they pay good wages to their operatives. In other business enterprises, it is a maxim that prices include a profit. If there are no profits, there is bankruptcy. There is no reason why transportation rates should not be adjusted upon the same basis. In the latter case, it being a matter affecting the whole people, the adjustment must be made with the concurrence of public officials. Of what vital importance it is, therefore, that such officials should be men of fair minds, clear minds, and act in the light of knowledge.

All these things can be accomplished. They must be accomplished. Who are better equipped than bodies of men such as are here assembled, to aid in their accomplishment? Achievement awaits volunteer effort. Shall we enlist?

Colonel H. G. Prout, vice-president and general manager of the Union Switch & Signal Company, spoke along the same line. He said that it would be necessary, in order to restore the purchasing power and the borrowing power of the railroads, to seek the cause of their decline, and added that to talk overcapitalization was not worthy of serious notice. He asserted that the railroads of the United States as they stand to-day in the aggregate, are undercapitalized rather than overcapitalized, and the remedy for the present condition is to create a correct public opinion. Regarding the railroad situation, he added a few words in commendation of railroad officials as he had found them in general, and said in conclusion: "The organization which we now have in mind comes at a critical moment. The railroad companies are chastened—they will be glad to have help; and the workingmen also are chastened, and if I am not much mistaken, before next spring they will be in a mood even more receptive to correct ideas than their present mood. We ourselves have not escaped the chastening rod, and are much more disposed to devote some time and energy to other work than putting up prices than we were 18 months ago."

Charles A. Moore, president of Manning, Maxwell & Moore, Inc., said that while the movement should not be regarded as one having anything to do with politics, it should be borne in mind that the organization must fight wherever it might be found necessary to fight legitimately, and he advocated prompt and immediate action toward making the association effective. T. A. Griffin of the Griffin Wheel Company, A. H. Mulliken of the Pettibone-Mulliken Company, and General Charles Miller of the Galena Oil Company also spoke. A resolution to form the organization was offered by Colonel Prout and adopted.

The Officers Selected.

The chairman appointed a committee to nominate officers and arrange the plan and scope of the organization, and an adjournment was taken until the evening, when the following officers were elected:

President, George A. Post, president Standard Coupler Company; vice-presidents, H. H. Westinghouse, vice-president Westinghouse Air Brake Company, Pittsburgh; Otis H. Cutler, president American Brake Shoe & Foundry Company, New York; W. H. Marshall, president American Locomotive Company, New York; E. D. Keith, president Keith Car Mfg. Company, Sagamore, Mass.; A. H. Mulliken, president Pettibone-Mulliken Company, Chicago; C. P. Letchworth, president Pratt & Letchworth Company, Buffalo; treasurer, Charles A. Moore, president Manning, Maxwell & Moore, Inc., New York. Executive Committee: W. G. Pearce, vice-president Griffin Wheel Company, Chicago; W. V. Kelly, president American Steel Foundries, New York; N. G. Prout, vice-president Union Switch & Signal Company, Pittsburgh; J. S. Coffin, president Franklin Railway Supply Company, Franklin, Pa.; N. Paul Fenner, Jr., president American Valve & Meter Company, Cincinnati; E. L. Adreon, vice-president American Brake Company, St. Louis; J. H. Schwacke, vice-president William Sellers & Co., Inc., Philadelphia; A. M. Kittredge, Barney & Smith Car Company, Dayton, Ohio, and J. F. Dickson, president Dickson Car Wheel Company, Houston, Texas.

Funds were subscribed at the evening meeting, and the Executive Committee arranged to meet shortly afterward at the Railroad Club to complete the details of the organization. The concerns participating in the conference were as follows:

Adams & Westlake Company, Chicago, Ill.
Ajax Forge Company, Chicago, Ill.
American Balance Valve Company, Jersey Shore, Pa.
American Brake Shoe & Foundry Company, New York.
American Car & Equipment Company, Chicago, Ill.
American Locomotive Company, New York.
American Locomotive Sander Company, Philadelphia, Pa.
American Valve & Meter Company, Cincinnati, Ohio.
Anglo-American Varnish Company, Newark, N. J.
Ashton Valve Company, Boston, Mass.
Atha Steel Casting Company, Newark, N. J.
Baldwin Locomotive Works, Philadelphia, Pa.
Barney & Smith Car Company, Dayton, Ohio.
Bethlehem Steel Company, Bethlehem, Pa.
Bettendorf Axle Company, Davenport, Iowa.
Bliss Electric Car Lighting Company, Chicago, Ill.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.
Buckeye Steel Castings Company, Columbus, Ohio.
Bucyrus Company, Cleveland, Ohio.
Buda Foundry & Mfg. Company, Chicago, Ill.
Buffalo Brake Beam Company, New York.
Butler Drawbar Attachment Company, Cleveland, Ohio.
Cardwell Mfg. Company, Chicago, Ill.
Chicago-Cleveland Car Roofing Company, Chicago, Ill.
Chicago Railway Equipment Company, Chicago, Ill.
Cleveland City Forge & Iron Company, Cleveland, Ohio.
Cleveland Frog & Crossing Company, Cleveland, Ohio.
Commercial Acetylene Company, Chicago, Ill.
Commonwealth Steel Company, St. Louis, Mo.
Consolidated Car Heating Company, Albany, N. Y.
Cook's Standard Tool Company, Kalamazoo, Mich.
Damascus Brake Beam Company, Cleveland, Ohio.
John Davis Company, Chicago, Ill.
Dayton Mfg. Company, Dayton, Ohio.
Dearborn Drug & Chemical Company, Chicago, Ill.
F. W. DeVoe & C. T. Reynolds Company, New York.
Joseph Dixon Crucible Company, Jersey City, N. J.
Dressel Railway Lamp Works, New York.
G. Drouve Company, Bridgeport, Conn.
O. M. Edwards Company, Syracuse, N. Y.
Farlow Draft Gear Company, Baltimore, Md.
Flannery Bolt Company, Pittsburgh, Pa.
Flood & Conklin, Newark, N. J.
Franklin Railway Supply Company, Franklin, Pa.
Fuller Bros. & Co., New York.
Galena Signal Oil Company, Franklin, Pa.
General Railway Signal Company, Rochester, N. Y.
Goodwin Car Company, New York.
Gould Coupler Company, New York.
Gold Car Heating & Lighting Company, New York.
Griffin Wheel Company, Chicago, Ill.
Hunt-Spiller Mfg. Corporation, Boston, Mass.
Ingersoll-Rand Drill Company, New York.
International Seal Company, New York.
Jenkins Bros., New York.
Kay & Ess Company, Dayton, Ohio.
Kennicott Water Softener Company, Chicago, Ill.
Link Belt Company, Philadelphia, Pa.
Charles R. Long, Jr., Company, Louisville, Ky.
McConway & Torley Company, Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., New York.
Michigan Lubricator Company, Detroit, Mich.
Middletown Car Works, Middletown, Pa.
W. H. Miner Company, Chicago, Ill.
Morden Frog & Crossing Works, Chicago, Ill.
Murphy Varnish Company, Newark, N. J.
Nathan Mfg. Company, New York.
National Dump Car Company, Chicago, Ill.
National Lock Washer Company, Newark, N. J.
National Malleable Castings Company, Cleveland, Ohio.
New York Air Brake Company, New York.
Niles-Bement-Pond Company, New York.
Otto Gas Engine Works, Chicago, Ill.
Pantasote Company, New York.
Pettibone-Mulliken Company, Chicago, Ill.
Pittsburgh Spring & Steel Company, Pittsburgh, Pa.
Pratt & Letchworth Company, Buffalo, N. Y.
Protectus Company, Philadelphia, Pa.
Pyle-National Electric Headlight Company, Chicago, Ill.
Quincy-Manchester-Sargent Company, New York.
Railroad Supply Company, Chicago, Ill.
Railways Materials Company, Chicago, Ill.
Ralston Steel Car Company, Columbus, Ohio.
Ramapo Iron Works, Hillburn, N. Y.
Rodger Ballast Car Company, Chicago, Ill.
Safety Car Heating & Lighting Company, New York.
William Sellers & Co., Inc., Philadelphia, Pa.
Charles A. Sherburne, Boston, Mass.
Sherwin-Williams Company, New York.
James B. Sipe & Co., Pittsburgh, Pa.
Standard Coupler Company, New York.
Standard Steel Car Company, Pittsburgh, Pa.
Storrs Mica Company, Owego, N. Y.
T. H. Symington Company, Baltimore, Md.
Transue & Williams Company, Alliance, Ohio.
Union Switch & Signal Company, Swissvale, Pa.
U. S. Metal & Mfg. Company, New York.
Verona Tool Works, Pittsburgh, Pa.
Vulcan Iron Works Company, Toledo, Ohio.
Ward Equipment Company, New York.
Watson-Stillman Company, New York.
Westinghouse Air Brake Company, Pittsburgh, Pa.
Westinghouse, Church, Kerr & Co., New York.
Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
Wolfe Brush Company, Pittsburgh, Pa.
Worth Brothers Company, Coatesville, Pa.
Wyckoff Pipe & Creosoting Company, New York.

Since the meeting a number of other companies and firms have applied for membership.

An enormous quantity of mail matter was dispatched to Great Britain October 1 and succeeding days by business houses which had been permitting it to accumulate, awaiting the reduction in letter postage to 2 cents.

Customs Decisions.

Rifle Barrels.

It was decided, October 3, by the Board of United States General Appraisers that forged rifle barrels, rough bored, are dutiable properly under the provision in the tariff act for "rifles and parts thereof" with duty at the rate of 25 per cent. The action of the collector at Boston in assessing importations of the goods made by J. G. Riga, at 45 per cent. under the metal schedule, is not approved. The Government alleged in support of the classification imposed by the collector that the provision in the law for "rifles and parts thereof" should be held to include only such parts as are in a finished condition when imported, complete and ready for adjustment. In sustaining the importer's contention, General Appraiser Fischer, in his decision for the board, says in part:

> We are of the opinion that the provision of the tariff referred to should not be narrowed to the extent indicated by the Government counsel. We believe that when an article as imported affords evidence as to the use to which it is to be applied and has reached a form and stage wherein it is fit for no other useful purpose than as a part of a rifle, that then for tariff purposes it may safely be regarded as within the provision for parts of rifles.

Statuary.

Another of the many attempts by the Board of United States General Appraisers and the Federal courts to define the technical meaning of the word "statuary" as used in the tariff act has just been made by the General Board. This time the question at issue does not concern marble statuary, but deals with work executed in bronze. The issue, which is brought by B. Altman & Co., New York, alleges that a bronze statue or bust of Louis XVI. should be allowed to enter this country at the rate of 15 per cent. ad valorem under the provisions of Section 3 of the present tariff law, and the reciprocal commercial agreement with France, which convention provides, among other things, for the importation of paintings and statuary at the low rate specified above. The customs authorities, however, declined to consider the claim made by the importers, and the bust was therefore assessed for duty at the rate of 45 per cent. as a "manufacture of metal."

A great deal of testimony was laid before the Board of Appraisers, both by the Government and by the importers. The Government sought to have the decision of the classifying officers upheld, while the Altman firm made a strong effort to convince the lower tribunal that the metal piece is, in fact, "statuary." Judge Waite, who writes the decision for the board, finds, however, that the contention of the Treasury Department is correct, and upholds the claim for the imposition of duty as a "manufacture." In brief, the board holds that a bronze statue which was cast in a foundry by artisans from a model made by an artist in some plastic material, but upon which metal casting the artist has done little or no retouching, is not "statuary wrought by hand from metal," under paragraph 454 of the Dingley act, but is dutiable as a "manufacture of metal," as assessed by the custom house officials.

In interpreting the reciprocal agreement between France and the United States, Judge Waite lays down the rule that the provision for "statuary" in Section 3 of the tariff law, and in the French reciprocal commercial agreement, is qualified by the statement in paragraph 454 of the tariff that "the term 'statuary' as used in this act shall be understood to include only such statuary as is cut, carved or otherwise wrought by hand from a solid block or mass of marble, stone, or alabaster, or from metal, and as is the professional production of a statuary or sculptor only."

Martin A. Knapp, chairman of the Interstate Commerce Commission, has approved the draft of the new uniform bill of lading which is to go into effect November 1 (as printed in *The Iron Age* of July 23, 1908, page 250) and urges its adoption by shippers in all freight territories. C. C. McCain, commissioner of the Trunk Line Association of Railroads, has prepared circulars describing in detail the uses of the new forms, which will be distributed broadcast among shippers.

The Stassano Electric Furnace.

M. Stassano, the pioneer in the development of the electric furnace and its application to the metallurgy of iron, has recently submitted his latest results in a memoir in the *Revue de Metallurgie*, whose editors are Henry le Chatelier and Leon Guillet. The results accomplished by Stassano from 1889 to 1906 were presented by him in a paper read in the latter year before the Rome International Congress of Applied Chemistry were the following: There is required a maximum of 4 hp. hours to do in an electric furnace the same thermic work as is produced in the best coal furnace by 1 kilogram of good fossil fuel, and, therefore, with hydro-electric plant capable of furnishing an electric horsepower per annum at 40 francs, electrometallurgy is on an even basis with ordinary metallurgical processes to which coal at 20 francs per ton is available.

In order to accomplish metallurgical results, the apparatus used must meet the following conditions: The locality in which the transformation of electrical energy into heat is carried out must not be subject to the direct action of the atmospheric air, and must be absolutely neutral chemically.

The heat developed by this transformation must produce as high a temperature as possible.

The substances to be treated must not be in direct contact with foreign substances which have a hurtful effect upon their composition.

The apparatus in which these different metallurgical operations are conducted must be so constructed that they always work with full charges, and the processes for obtaining this final result must favor these conditions.

The Furnace.

Stassano's latest design of furnace, which is of the revolving type, is shown in the accompanying engravings.

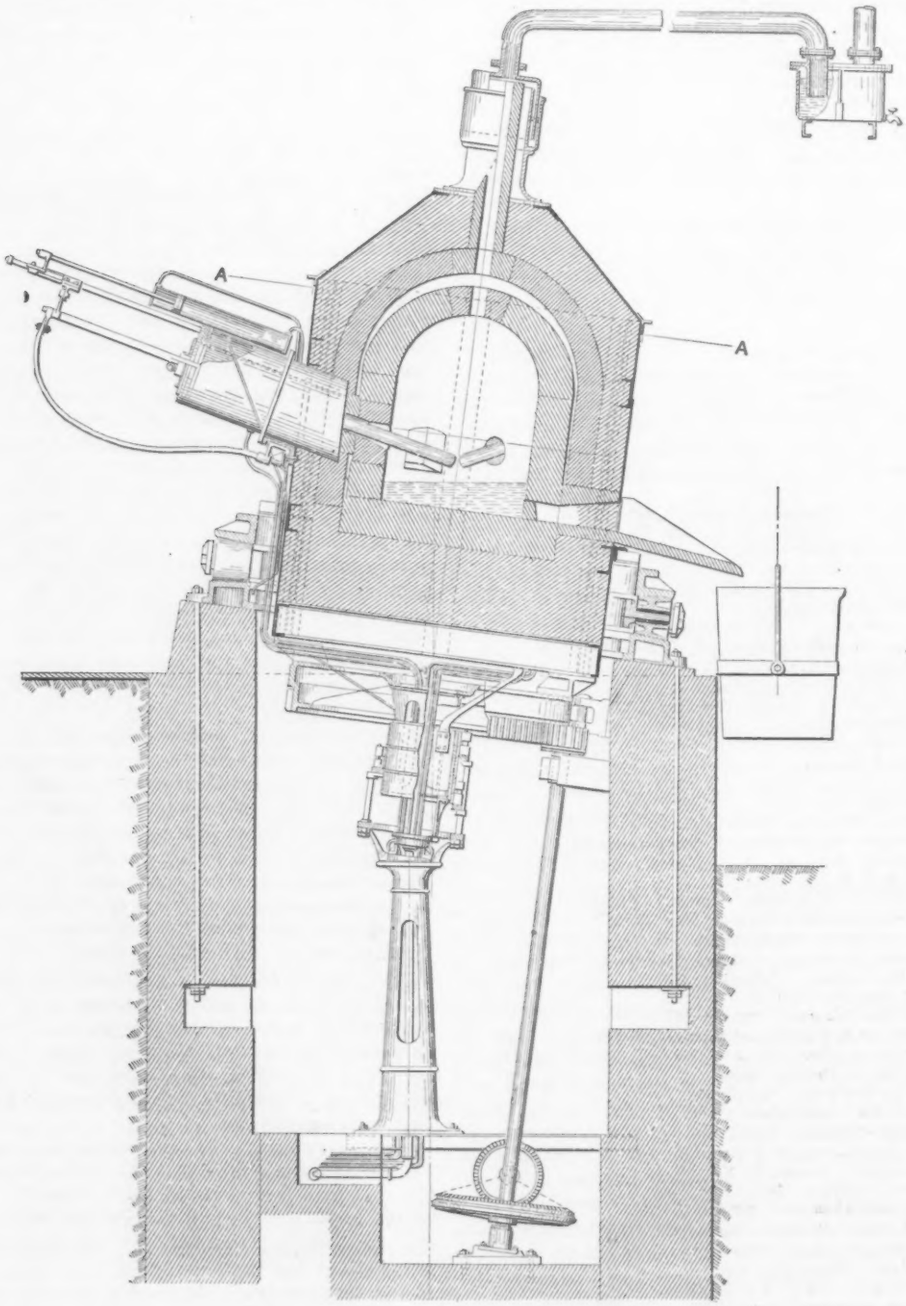


Fig. 1.—The Stassano Electric Furnace.

He also builds stationary furnaces with one or more units. As will be noted from Figs. 1 and 2, the furnace consists of a cylindrical shell lined with refractory material, in which there is a melting chamber. Into this reach the electrodes. Double walled water cooled cylinders provided with guides attached to the furnace shell, contain, support and guide the carbon electrodes. The latter are operated by hydraulic rack and pinion. Flexible cables connect the electrodes with the current collector placed below the furnace shell. The furnace rests, by means of a ring firmly attached to the shell, upon a circular rail placed on an inclined plane, so that the axis of the furnace is at a determined angle from the vertical.

The gearing for revolving the furnace is shown in the drawing. In the center of the gear wheel are copper rings which are insulated from the furnace, and they connect electrically with the cables to the electrodes. The furnace is provided with a tap, as shown in Fig. 1, and with a charging door, indicated in Fig. 2. A flue is provided in the crown of the melting chamber, from which a pipe leads to a vessel filled with water, from which the gases are discharged or are collected if their character makes it desirable to utilize them.

Stassano makes the following points in regard to the design of his furnace:

The atmosphere in the melting chamber is perfectly neutral chemically.

The transformation of the electric energy into heat energy is obtained by means of the arc, by which the highest known temperature attainable in practice may be reached.

The materials to be treated are not in contact with the electrodes, and therefore their composition cannot be modified by the absorption of foreign substances.

By attaining a vigorous mixture of the melting materials, through the rotating of the furnace, the chemical reactions are facilitated, aided, as they are, by the high temperature. The time required for the reactions is therefore reduced to a minimum, so that full charges

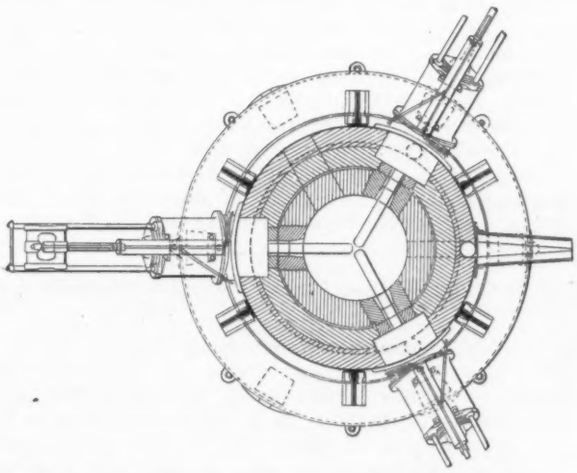


Fig. 2.—Cross Section of the Stassano Electric Furnace at A A on Fig. 1.

can always be worked and the energy is utilized to best advantage.

Stassano goes into a general discussion of the field of the electric furnace, both for localities where the presence of cheap ores and cheap water power render direct manufacture possible, and for localities where it may be an adjunct, as a refining furnace, for Bessemer and open hearth plants. He quotes a series of practical results selected from the operations of 200 horsepower furnace, built in 1903 by the Ministry of War, at the arsenal at Turin, where steel for projectiles is made, and of furneces at the works of the Societe Forni Termoiettrici Stassano at Turin, where there are installed two fixed 100 hp. furnaces, one rotating 200 hp. furnace, one tilting 200 hp. furnace, and two 1000 hp. furnaces one fixed and one rotating. All of these furnaces, at both plants, usually run on pig iron and scrap. But at different times at the Stassano works, which are regularly employed in making castings for the automobile industry, for railroad and tramways, practical runs have been made on the direct treatment of ores and in producing special alloys.

Results Obtained.

Stassano has tabulated his results in rather an inconvenient manner. We present them below in somewhat different form:

Direct Ore Reduction.—The charges consisted of 1000 kms. of ore containing 68.70 per cent. oxide of iron, 3.22 per cent. of oxide of manganese, 17.15 per cent. of silica, 2.0 per cent. of alumina, 1.0 per cent. of lime, 5.67 per cent. of magnesia, 0.15 per cent. of phosphorus, and 0.12 per cent. of sulphur, of 350 kms. of limestone, 240 kms. of charcoal, 80 kms. of an aqueous solution of silicate of soda, and, after the removal of the cinder, 50 kms. of calcium carbide.

The analysis of the products of four heats was as follows:

	1.	2.	3.	4.
Carbon	0.25	0.26	0.30	0.80
Manganese	0.12	0.21	0.24	0.30
Silicon	0.07	0.03	0.14	0.22
Phosphorus	0.01	0.01	0.015	0.015
Sulphur	0.065	0.04	0.07	0.045

To the fourth heat there was added some hematite pig iron for the sake of carburizing after the withdrawal of the cinder.

The consumption of power for the four heats was 4.5, 4.3, 4.0 and 4.2 kw. hours per kilogram of product. Mechanical tests of the second and third heat showed a tensile strength of 55 kms. per square centimeter and an elongation of 23 per cent. The fourth heat showed 86.3 kms. and 13 per cent., respectively.

Special Alloys.—Three heats from tungsten ore were made in a 100 hp. furnace, with a charge consisting of 1000 kms. of tungsten ore containing 69.9 per cent. of $W O_3$, 2 per cent. of silica, 20.5 per cent. of protoxide of iron, 7.3 per cent of protoxide of manganese, 0.20 per cent. of sulphur and traces of lines magnesia and phosphorus, of 190 kms. of charcoal, 40 kms. of lime, and 80 kms. of a 25 per cent. aqueous solution of silicate of soda. The theoretical composition of the steel was 20.6 per cent. of iron, 71.5 per cent. of tungsten, 7.1 per cent. of manganese, and 1 per cent. of silicon. The actual composition of three heats was as follows:

	1.	2.	3.
Iron	35.2	28.63	22.715
Tungsten	58.0	65.66	69.70
Carbon	2.4	2.062	2.508
Manganese	3.192	3.5	3.6
Silicon	1.244	1.028	1.3

There were only traces of sulphur and phosphorus. The consumption of power was 6000 kw. hours per kilogram of steel for the first heat, 6800 for the second, and 7500 kw. hours for the third.

A heat was made to produce a silico-manganese with approximately 60 per cent. of manganese and 20 per cent. of silicon. There were used 1000 kms. of manganese ore with 45.65 peroxide of manganese, 16.1 per cent. of sesquioxide of iron, 3.05 per cent. of alumina, 30.16 per cent. of silica, 0.15 per cent. of baryta, 1.2 per cent. of lime, 0.43 per cent. of magnesia, 0.817 per cent. of sulphur, and 0.34 per cent. of phosphoric acid; also 300 kms. of charcoal, 60 kms. of lime, and 80 kms. of a 25 per cent. aqueous solution of silicate of soda.

The steel carried 17.6 per cent of silicon, 62 per cent. of manganese, 1.8 per cent. of carbon, traces of sulphur, and 0.028 per cent. of phosphorus. The consumption of power was 7400 kw. hours per kilogram.

Melting Projectile Steel.—The following results of 18 heats produced during the manufacture of projectile steel with a 200 hp. furnace at the Turin Arsenal. The charge consisted of 350 kms. of scrap, 200 kms. of broken projectiles, 100 kms. of turnings, 2.5 kms. of ferro-silicon, 10.5 kms. of ferromanganese, 0.2 km. of aluminum, 6 kms. of lime, and 1 km. of ore.

Analysis of Projectile Steel, Turin Arsenal.

Analyses of product.					Mechanical tests. Weight of product.	Tensile strength. Kg. per sq. mm.	Elongation.
C.	Mn.	Si.	P.	S.	Kg.		%
0.420	1.231	0.180	0.03	0.03	650	67	19
0.440	1.498	0.180	0.03	0.03	665	74	17
0.425	1.440	0.180	0.03	0.03	642	71	20
0.400	1.386	0.180	0.03	0.03	630	67	19
0.465	1.224	0.200	0.035	0.04	663	72	17
0.495	1.404	0.200	0.035	0.04	662	78	15
0.490	1.440	0.200	0.035	0.04	656	78	16
0.430	1.260	0.150	0.025	0.035	656	69	18
0.525	1.296	0.150	0.025	0.035	650	79	15
0.460	1.476	0.150	0.025	0.035	640	76	16
0.515	1.436	0.150	0.025	0.035	670	81	15
0.505	1.540	0.150	0.025	0.035	656	83	14
0.450	1.264	0.170	0.031	0.033	650	76	16
0.415	1.440	0.170	0.031	0.033	650	71	18
0.445	1.332	0.170	0.031	0.033	652	76	16
0.400	1.444	0.170	0.031	0.033	652	69	18
0.405	1.501	0.180	0.030	0.027	655	71	18
0.465	1.303	0.180	0.030	0.027	650	73	17
					11.749		

The consumption of power per kilowatt hour per kilogram of steel produced was 1250 kw. The total charge was 11,934 kg., and the yield 11,749 kg., thus showing a waste of 1½ per cent.

Producing Soft Steel Castings.—The following series of heats were made in the 200 hp. rotating and tilting furnace at the Stassano plant at Turin, the object being to produce soft steel castings from scrap material.

Charge and Analyses of Materials.

		C.	Sil.	Sul.	Phos.	Mn.
1. Scrap, old shovels and tools	330 K	0.245	0.046	0.085	0.034	0.757
2. Iron and steel scrap	330 K	0.350	0.140	0.050	0.110	0.810
3. Highly oxidized scrap	70 K	0.300	0.105	0.080	0.056	0.070
4. Hematite pig iron	18 K	3.800	1.80	0.01	0.015	0.350
5. Ferrosilicon	2.2 K*	0.35	51.65	...	0.130	0.36
6. Ferromanganese	6 K†	6.409	0.233	...	0.295	70.732
Lime	30 K					
Calcium carbine	4 K					

* Iron, 40 per cent. † Iron, 19 per cent.

The steel produced showed the following analyses:

Analyses of Steel.

No.	Car	Sil.	Sul.	Phos.	Man.
1	0.20	0.33	0.050	0.038	1.02
2	0.22	0.10	0.045	0.030	0.42
3	0.22	0.17	0.052	0.026	0.50
4	0.26	0.09	0.048	0.025	0.49
5	0.26	0.28	0.040	0.035	0.44
6	0.25	0.20	0.050	0.035	0.41

A cast and annealed sample of the second heat showed a tensile strength of 42 kilos and an elongation of 19 per cent., while the further heat had 45 kilos and 17.5 per cent., respectively.

A second group of heats was made up of the same materials, except that 250 kms. of cast steel scrap was also used containing 0.23 carbon, 0.15 silicon, 0.042 sulphur, 0.03 phosphorus, and 0.45 manganese. The charge was made up of 250 kms. of this scrap, of 350 kms. of scrap No. 1, 150 kilos of scrap No. 2, 70 kilos of scrap No. 3, 28 kilos of hematite pig, 33 kilos of ferrosilicon, 3.2 kilos of ferromanganese, 30 kilos of lime, and 4 kilos of calcium carbide.

Analyses of Second Group.

No.	Car.	Sil.	Sul.	Phos.	Man.
1	0.27	0.13	0.04	0.025	0.399
2	0.23	0.28	0.05	0.025	0.46
3	0.14	0.49	0.045	0.029	0.42
4	0.22	0.16	0.04	0.031	0.41
5	0.20	0.45	0.04	0.026	0.46
6	0.22	0.17	0.043	0.030	0.39
7	0.18	0.11	0.051	0.030	0.44
8	0.20	0.10	0.04	0.025	0.39

Charge No. 1 showed a tensile strength of 43 kilos per square inch and an elongation of 20 per cent. No. 2 recorded 40 kilos and 18.5 per cent, No. 5, 42 kilos and 17 per cent., and No. 6, a tensile strength of 42 kms. per square millimeter and an elongation of 20.5 per cent.

A number of other heats are given, but they do not develop any special points. The consumption of power for this class of work averaged for the whole of the year 1907, 1260 kws. per kilogram of metal.

Special Steels.—The following heats were made on special steels at the Stassano works in 200-ton rotating and tilting furnaces. The analyses of the raw materials and product are given:

Nickel Steel.

Materials.	Kilos.	Car.	Sil.	Sul.	Phos.	Man.
Plate scrap	400	0.30	0.13	0.070	0.290	0.210
Oxidized scrap	200	0.30	0.105	0.083	0.057	0.07
Ferrosilicon	1.5	0.35	57.65	....	1.30	0.36
Ferromanganese	4	6.41	0.253	....	0.295	70.32
Nickel (99 per ct.)	24	...	....	....	....	...
Lime	20	...	....	....	....	...
Calcium carbide	5	...	....	....	....	...
Product:						
No. 1	..	0.18	0.123	0.048	0.007	0.78
No. 2	..	0.165	0.110	0.015	0.007	0.69

No. 1 contained 5.6 per cent. of nickel.

No. 2 charge, to which 5 additional pounds of calcium carbide was added, carried 5.56 per cent. of nickel. No. 1 had a tensile strength of 56 kilos per square millimeter and 29 per cent. of elongation, while No. 2 had 54.5 kilos and 30.1 per cent.

For a second heat, a steel to contain 1.5 carbon, 1.0 manganese, 0.127 silicon, 12.725 tungsten and 3.69 per cent. of chrome was aimed at, the analyses of raw materials and product being as follows:

Tungsten Chrome Steel.

Materials.	Kilos.	Car.	Sil.	Sul.	Phos.	Man.
Rusted scrap	150	0.30	0.105	0.083	0.057	0.07
Steel scrap	200	0.35	0.14	0.05	0.110	0.81
Foundry scrap	236	0.23	0.15	0.05	0.037	0.45
White pig	60	3.42	0.27	0.083	0.115	2.31
Hematite pig	45	3.80	1.80	0.01	0.015	0.35
Ferromanganese	9	6.41	0.25	...	0.295	70.31
Ferrochrome (70 %)	36.5	5.80	1.30	0.07	0.028	0.45
Tungstic acid	117	...	...	...	....	...
Lime	30	...	...	...	....	...
Calcium carbine	12	...	...	...	....	...
Charcoal	24.5	...	...	...	....	...
Aluminum	1.5	...	...	...	....	...
Product	..	1.56	0.062	0.012	0.01	0.975

Tungsten, 12.9 per cent. Chrome, 3.5 per cent.

Another heat dealt with a tungsten steel to contain 1.5 per cent. of tungsten and 0.40 per cent. of manganese.

The charge consisted of 200 kms. of hematite pig, 600 kg. of old shovel and tool scrap, 2 kg. of ferrosilicon, 3 kilos of ferromanganese, 16 kg. of tungstic acid, 1 kg. of aluminum, 5 kg. of calcium carbide, and 25 kg. of lime. The steel carried 0.96 carbon, 0.123 silicon, 0.018 sulphur, 0.015 phosphorus, 0.6 manganese and 1.56 tungsten.

Stassano gives further data obtained in 1000 hp. stationary and rotating furnaces at the Turin works in making steel castings and projectile steel.

He states that according to the experience at the two plants at Turin, the consumption of electrodes does not exceed 10 kg. per ton of steel produced, that the cost of repairs to the lining averages 10 francs per ton, and only in exceptional cases does it rise to 14 or 15 francs. For furnaces up to a capacity of 300 hp. a crew of three men suffice. For a 1000-hp. furnace, five, or at most six, men are needed for melting with cold stock. For liquid metal or for ore only four men are required.

In addition to the two plants at Turin, Italy, there has been started recently a 250 hp. rotary furnace at the works of the Bonner Fraeserfabrik at Bonn on the Rhine.

Century Single Phase Elevator Motors.

A single phase motor particularly adapted for elevator service, and claimed to give practically as good results as a direct current motor, has recently been developed by the Century Electric Company, Nineteenth and Olive streets, St. Louis, Mo. A very good power factor and efficiency have been secured, and still no auxiliary inductive devices, auto transformers, slip rings, rheostats or other supplementary appliance are made use of beyond a plain reversing noninductive resistence controller installed in series with the motor to limit the starting current. Being a repulsion induction cummutator motor, it is, in principle of operation, substantially equivalent to the company's single phase self-starting constant speed induction motor while in its starting condition. It differs radically from the constant speed motor, however, in that while operating the commutator is in service all the time.

The motor has a centrifugal device which short circuits the armature at synchronism to hold back the load when the elevator is driving the motor. The governor device places the commutator in service again as soon as the motor speed has dropped 10 degrees below synchronism. The motor gives 120 per cent. of full load starting torque with about 130 per cent. of full load current. In normal operation these motors seldom take from the line in excess of 130 per cent. of full load current; all ordinary starts require less than 100 per cent. full load torque.

The motors are made for 60-cycle current in the following standard sizes: 10 hp., 1080 rev. per min.; 7½ hp., 810 rev. per min.; 7½ hp., 1080 rev. per min., and 5 hp., 810 rev. per min. Any of these can be furnished for as low as 104 volts, except the 10 hp. size. The new motor is described and the characteristics diagramed in the company's bulletin No. 11, recently issued.

The Bethlehem Steel Company will move its New York offices November 2 from 100 Broadway to the Trinity Building, 111 Broadway, where it will occupy half of the eleventh floor.

The Lake Superior Corporation.

The fourth annual report of the Lake Superior Corporation, covering operations for the fiscal year ending June 30, 1908, gives the following income account:

*Interest and dividends from subsidiary companies		$491,613.85
Interest on advances to subsidiary companies, accrued interest on bonds and bank balances		74,552.96
Rental		451.35
		$566,618.16
Coupons paid:		
First mortgage bonds	$500,000.00	
Less interest on treasury bonds	53,658.34	
	$446,341.66	
Interest on loans	28,884.44	
General expenses	63,522.49	
		538,748.59
Balance to profit and loss account		$27,869.57
Surplus June 30, 1907		471,313.02
Surplus June 30, 1908		$499,182.59

* In addition to interest and dividends paid, as stated, the subsidiary companies have reserved $580,386.30 from net earnings for the year for extensions and working capital.

The balance sheet as of June 30, 1908, is as follows:

Assets.

Investments and securities—subsidiary companies	$51,430,901.23
Cash on hand	9,485.66
Cash reserve for unpaid coupons	12,350.00
Accounts secured by bonds	60,000.00
Treasury bonds and accrued interest thereon	1,013,204.17
Due from subsidiary companies	1,396,720.92
Accounts receivable	5,610.08
Interest in suspense	1,105.64
Total	$53,929,377.70
In addition there is held for the account of the Algoma Central & Hudson Bay Railway Company, to be used in the extension of its line:	
Cash	$62,419.57
First mortgage bonds of the Lake Superior Corporation	345,000.00

Liabilities.

Capital stock	$40,000,000.00
First mortgage bonds	10,000,000.00
Income bonds	3,000,000.00
Bills and accounts payable	315,750.00
Coupons unpaid	12,350.00
Accrued interest on bonds and loans	42,877.49
Suspense account	59,217.62
Profit and loss balance, July 1, 1908	499,182.59
Total	$53,929,377.70

From the accompanying statement of President Charles D. Warren, the following extracts are taken regarding the operations of some of the subsidiary companies:

The Algoma Steel Company, Ltd.—This reduction in railroad construction produced a curtailment of rail orders, as a result of which it was necessary to close down the steel plant for about one-third of the year. Notwithstanding, the company is able to show an excellent record, showing net earnings of $501,258.50, after deducting all charges, including interest on advances, with an output for the year as follows: Pig iron, 135,852 tons; standard steel rails, 142,958 tons. The large quantity of pig iron which has had to be purchased throughout the year at high prices emphasizes the necessity of the company increasing its blast furnace capacity.

Lake Superior Iron & Steel Company, Ltd.—This company has had a very successful year's operation, having produced 31,773 tons of open hearth steel, from which were rolled 25,321 tons of open hearth rails, with earnings for the year of $51,243.42. The very bountiful crop which has just been harvested throughout Canada, coupled with the fact that the railroad companies have done little building during the year, will stimulate railroad construction during the next current year, and it is confidently expected that increased rail orders to the company will result.

The Lake Superior Power Company.—This company continues to supply power for the operation of the subsidiary companies of the corporation, and is the owner of and conducts the operations of the Helen Mine. The company shows a surplus this year of $265,943.94 in excess of expenses of operation, after deducting all charges, including interest on advances. This excellent result is due largely to the increased shipments of ore from the Helen Mine. The ore from this mine has increased in quantity and improved in quality in the lower levels which have been worked during the past year. The output was 150,623 tons of ore, being an increase over the previous year of 57,000 tons.

General Results.

The year's operations of the various subsidiary companies show a net surplus of $1,072,000.15, an amount in excess of the net earnings of the previous year by $214,879.53.

For the past four years the subsidiary companies have been largely dependent upon loans from banks to enable them to purchae the necessary materials for the transaction of their business. The financial panic of 1907, however, made it clear that it was unsafe for the subsidiary companies to depend upon outside sources for so large a proportion of their necessary working capital, and their directors have, therefore, determined that a substantial part of the year's earnings must be retained for working capital and for making necessary repairs and additions.

While, therefore, the earning of the subsidiary companies have been, under the circumstances, highly satisfactory, yet, by reason of the necessity of these companies retaining so large a part of their earnings for working capital and necessary extensions, the receipts of the corporation from the subsidiary companies have not warranted your directors in paying interest on the income bonds.

The Prevention of Foundry Accidents.

The Committee on the Prevention of Accidents in Foundries, appointed by the American Foundrymen's Association at its Toronto convention in June last, has entered upon its work of gathering information from the foundries of the United States. A circular signed by Thomas D. West, chairman of the committee, and by Richard Moldenke, secretary of the association, is being sent to all the foundries in the country with a blank which foundrymen are asked to fill out and return to the secretary at Watchung, N. J. The circular says that the foundry industry offers peculiar opportunities for careless workmen to receive injury, and consequently proprietors are under an increasing burden, in view of the tendency to put all responsibility for accidents upon the employer.

In agitating for the lessening of the number of foundry accidents, the committee desires, first of all, to obtain data which will show just how much of the loss of life and property is really chargeable to unsafe shop conditions. The committee's blank provides for a report as to circumstances and consequences of foundry accidents in the United States between July, 1907, and July, 1908. Eleven classes of accidents are specified, as follows: Personal carelessness, careless work, inattention to surrounding shop conditions, intoxicants, smoking, unavoidable accidents, neglect of safety devices provided, disobedience of orders, taking chances, inferior workmanship or materials used, negligence on the part of employees. Under each of these heads are blank spaces calling for number killed outright, number fatally injured, number seriously injured, number slightly injured, cost of attention to cases, cost of repairs made necessary, and loss through fire resulting. The foundrymen are asked further to report the number of persons killed or injured through their own fault and through fault of co-employees, also the number killed or injured by burns or by bruises.

The expense of the inquiry is undertaken by the American Foundrymen's Association, the officers of which desire that foundrymen appreciate the importance of the end sought, and co-operate heartily in furnishing information. All communications are to be considered confidential. No names will be used in the reports of the committee, but only a summary of the figures. The committee believes that if the real causes of foundry accidents could be generally known, much of the drastic legislation continually proposed would appear in a different light.

Electrical Power for British Industries.

Its Relation to the Blast Furnaces and Coke Ovens on the Northeast Coast.

At the Middlesbrough, England, meeting of the Iron and Steel Institute, September 28 to October 1, a paper was presented by Charles H. Merz of London, entitled "Power Supply and Its Effect on the Industries of the Northeast Coast." It dealt with the development of electrical power for industrial use by companies specially organized for that purpose operating in the Northeast Coast District. The industries supplied with electricity by these companies are chiefly those of the Tyne District, of which Newcastle-upon-Tyne is the center, and of the Tees District of which Middlesbrough is the center. Midway between the two rivers is the famous Durham Coal Mining District. The region in question is thus about 45 miles from north to south, Blyth being at its northern extremity and Middlesbrough the principal town on the south. The average extent of the district from east to west is 25 miles, the coast forming the eastern boundary.

The companies and municipalities supplying current in different sections of the Northeast Coast are 12 in number, but nine-tenths of the total electricity sold is produced by the Newcastle-upon-Tyne Electric Supply Company, the Durham Electrical Power Distribution Company and the Cleveland & Durham Electric Power Company, so that Mr. Merz deals exclusively with these three companies.

Important Developments from Electric Stations.

It is noted in the beginning of the paper that electrical power supply has already had a marked effect upon the industries of the Northeast Coast. A great saving of coal and a reduction of smoke have resulted. On the Tyne, apart from the electric power companies, there is now practically no coal burned for power purposes except in chemical factories. The application of electricity to all new uses has been facilitated. Four new rolling mills are about to be driven electrically. New industries are being located solely on account of the cheap power available. A good beginning has been made in the utilization of waste heat and gases, and much more will be done in this direction in view of the large number of blast furnaces and coke ovens in the district.

The Northeast Coast manufacturing districts, with a population of 2,015,000 in 1901, or 4.8 per cent. of the entire population of the United Kingdom, made the following showing in the coal mining, coke making, iron mining, pig iron and shipping industries in 1906:

The results thus far attained by the three power companies above named are thus summarized: The supply of current to 80 miles (single track) of electrified railroad, current to four tramway systems, the lighting in towns with populations aggregating over 700,000, motive power to the extent of 85,000 hp. and electro-chemical operations of over 12,000 hp. The last named are new industries, attracted to the Tyne solely by cheap power supply. The paper then presents the following details:

Northeast Coast Industries.

	Coal mined, 1906.—Tons.	Make of coke. 1906.—Tons.	Ironstone mined. 1906.—Tons.	Pig iron. 1906.—Tons.	Shipping built. 1906. Net tonnage.
Northeast Coast industrial area	52,097,377	7,830,000	6,126,324	3,628,651	630,872
United Kingdom	251,067,628	19,296,526	15,500,406	10,109,453	1,156,771
Ratio: Northeast Coast to United Kingdom	20.7 %	40.5 %	39.5 %	36.0 %	54.5 %

Extent of Power Supply System.

The station from which the greater portion of the current is now supplied—Carville (located between Newcastle and the mouth of the Tyne)—was begun in 1903 by the installation of 14,000 electrical horsepower of steam turbine driven generators producing three-phase 40-cycle current at a pressure of 6000 volts. This installation has been increased fourfold during the past four years, so that the generating plant now aggregates 56,000 electric horsepower, and Carville has now a greater output of electricity than any other public supply station in Europe. From Carville the transmission and distribution networks extend westward to and through the city of Newcastle-upon-Tyne, northward 12 miles to Blyth, and eastward along the river Tyne to North Shields, while in a southerly direction the cables at present reach a point some 30 miles south of Carville, and extensions will shortly be completed linking up the northern cable network to the power system which has now been in operation some 18 months in the Middlesbrough District.

The table below gives the number and size of generating stations and a few particulars of the transmission and distribution systems. The capacity of plant installed represents about one-ninth of the total plant installed in public supply stations of the United Kingdom:

Particulars of Generating Stations.

Power station.	Type.	Hp. of plant installed.	Type of current.	Voltage.	Remarks.
Carville	Coal-fired.	56,000	3-phase. 40 cycles.	6,000	In operation.
Philadelphia	Coal-fired.	13,000	3-phase. 40 cycles.	6,000	In operation.
Neptune Bank	Coal-fired.	6,800	3-phase. 40 cycles.	6,000	In operation (stand by).
Grangetown	Coal-fired.	8,000	3-phase. 40 cycles.	12,000	In operation.
Hebburn	Coal-fired.	4,500	3-phase. 40 cycles.	6,000	In operation (stand by).
Weardale	Waste heat.	6,650	3-phase. 40 cycles.	3,000	In operation.
Newport	Waste heat.	4,000	3-phase. 40 cycles.	3,000	In operation.
Blaydon	Waste heat.	3,000	3-phase. 40 cycles.	6,000	In operation.
Capacity of plant installed		101,950			
Dunston	Coal-fired.	30,000	3-phase. 40 cycles.	6,000	Under construction.
Bankfoot	Waste heat.	3,300	3-phase. 40 cycles.	3,000	Under construction.
Tees-bridge	Waste heat.	1,300	3-phase. 40 cycles.	3,000	Under construction.
Capacity of plant under construction		34,600			
Total		136,550			

Of the waste heat stations named above, that at Newport (the Samuelson blast furnaces) and Teesbridge are exhaust steam stations; the Weardale station at Spennymoor is driven by coke oven gas, while the Bankfoot station at Crook will run chiefly on waste heat from coke ovens. The Blaydon station also utilized waste heat and gas from coke ovens.

Conditions Governing Power Supply.

A factor invariably of vital importance in the production of cheap current, whether by a public company or by a private manufacturer, is the capital expenditure per useful horsepower of plant. This decreases as the size of plant grows, while the running efficiency at the same time increases. The local conditions governing power supply in this district are:

1. The low price of coal, enabling manufacturers to produce power themselves at relatively low rates.

2. The fact that the manufacturers' works are mostly of considerable size—*i. e.*, their individual electrical requirements are large.

3. The existence of large quantities of potential energy in the form of waste heat and combustible gas.

The first and second conditions have been met by the power companies, in erecting their main generating stations, by taking full advantage of the best coal and water facilities available, by installing plant of capacity much in excess of that which any individual manufacturer, however large, could adopt, and by catering for all classes of consumers, thereby securing a diversity of load with a resulting constancy of output, and so utilizing the plant installed to the best advantage. These factors, combined with a skilled technical staff and attention to numberless relatively minor details, have resulted in an efficiency of production much greater than that practicable to a manufacturer producing power as an auxiliary to his main business.

Power Supply to Shipyards, Traction Lines and Mills.

Power supply in this district began on the north bank of the Tyne. It has naturally, therefore, reached its highest development there, and although even in this section of the area it is only seven years old, there is now not a single firm of shipbuilders or engineers on the north bank of the Tyne inside the Power Company's area of supply which does not take 95 per cent. of its power from the company, the remaining 5 per cent. being produced from small gas engines or from boilers fired with scrap wood. On the south bank of the Tyne progress has been equally rapid, while in the Tees area, although the Power Company only began operations in January of last year, it has already connected over 20,000 hp. of motors.

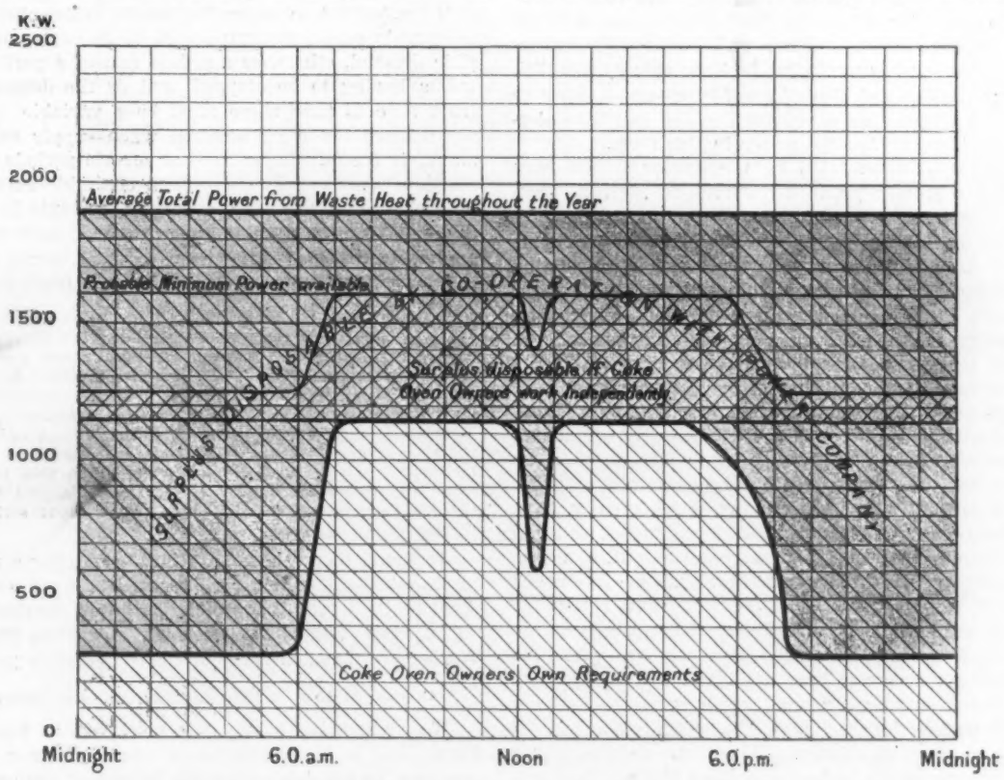
The credit of electrifying the Newcastle suburban railroads is due to the North-Eastern Railway Company, but the fact that it was the first important English railroad to electrify a portion of its system, and that it purchased the necessary electricity from the Power Company, shows that the availability of cheap power is an advantage not only to manufacturers, but to the public, in facilitating the introduction of electric traction. Since the electrification of the Newcastle system the train service has been more than doubled and the schedule speed improved by 20 per cent. A comparison with other cities at home and abroad shows that no other town of similar population, or, indeed, having twice the population, has so extensive an electrified railroad system and so frequent a suburban service, and this has, of course, resulted in a large increase of travel.

The application of electricity to rolling mills of the largest size is one of the most interesting industrial developments of recent years. The advantages offered are economy of running, closer speed regulation, better control of operations, and fewer breakages. There are now four new electrically driven rolling mills being installed in this area—two by Dorman, Long & Co.; one by the Bowesfield Steel Company, and one by a new company. The electricity for these will be purchased from the Power Company.

Power Supply to Coal Mines.

The supply of electricity to coal mines, beginning not more than four years ago, has not reached the same stage of development as in the case of other industries, though collieries having an output of some 8,000,000 tons per annum are taking, or are arranging to take, practically their whole supply from the power companies. This supply will include, among other apparatus, winders of 1600 hp. each, and it would appear that the supply of electricity to coal mines is likely to be of even greater magnitude than the supply to shipbuilding and heavy engineering works. In the latter cases the effect has been to conserve over 50 per cent. of the coal previously burnt for power generation.

The output of coal from Northumberland and Durham in 1906 was over 52,000,000 tons, and, according to the report of the Royal Commission on Coal Supplies, between 6 and 8 per cent. of the total coal brought to bank is used by the collieries for the purpose of power generation. About one-fifth of the coal mined on the northeast coast is converted into coke. Making a liberal allowance, therefore, for the power at present used from the surplus heat resulting from the coking process, the collieries of Northumberland and Durham must burn for their own power requirements some 2,500,000 tons of coal per annum. As the almost invariable rule is to work noncondensing, as the steam piping is usually long, and as a large portion of the load is intermittent, it is certain, and is proved by experience in this district, that the same power can be provided electrically in a large central power station by the consumption of less than a quarter of this coal. The application of electricity to coal mines in this district, when as complete as that to the Tyne shipyards, will render available for outside sale over 1,750,000 tons of coal, equivalent to, say, over £500,000 sterling per annum.



Estimated Daily Output and Load Curve of Waste Heat Station at Crook, England.—Electricity utilized by coke oven owners at mines and ovens = 5,500,000 Board of Trade units per annum. Maximum surplus available for outside sale, if coke oven owners work independently = 2,250,000 Board of Trade units per annum. Surplus disposable by co-operating with power company = 10,000,000 Board of Trade units per annum.

Surplus Energy from Coke Ovens and Blast Furnaces.

The counties of Northumberland and Durham and the North Riding of Yorkshire last year produced together 7,800,000 tons of coke. The bulk of this was made in the older fashioned beehive oven. Were the whole output produced in retort ovens there would be available waste gas and waste heat capable of developing over 150,000 hp. continuously, if used under boilers, or probably rather less than twice this amount, or, say, 250,000 hp. if the gas were used in gas engines.

The blast furnaces form a less important potential source of power. In evidence given before the Royal Commission on Coal Supplies it was estimated that if

gas engines were used exclusively for power purposes, then, after the requirements of the stoves and blowing engines had been met, there would still be available from the Cleveland furnaces a supply of surplus gas equivalent to 61,000 hp. continuously.

Methods of Utilizing Surplus Coke Oven Gas.

Each separate group of coke ovens usually consists of between 40 and 120 ovens, rarely exceeding the latter figure. The batteries are widely scattered throughout the county of Durham, and are for the most part at relatively long distances from the populous centers. The gas might be piped to some central point, as is the practice followed in America with natural gas, which is transmitted in some cases 200 miles; but this natural gas has twice the calorific value of coke oven gas, and it is usually available at a pressure of 50 lb. per square inch or upward, rendering it practicable to transmit a large volume of energy through a relatively small pipe, whereas, to transmit coke oven gas any distance, there would have to be installed an expensive compressing plant. Further, there is, in addition to the gas given off from the coke ovens, a certain quantity of waste heat which can only be utilized locally under boilers; and in no calculations which the author has made has he been able to establish a case for the transmission of gas for power purposes as against the alternative of converting the gas into electricity and transmitting the power in this form.

In all cases investigated by the author it has been found that a greater profit will accrue to the coke oven owner by co-operating with a power company than by proceeding on independent lines. There are three reasons for this: 1. When a private owner erects a generating plant independently he must install some reserve or spare plant, with a consequent heavier outlay of capital than is necessary to a power company, which, possessing a coal fired station, need install no spare plant in any of its waste heat stations, but can meet any variation of load by the coal fired station, which also acts as a standby against any breakdown. 2. This necessity of putting down spare plants results in smaller and therefore more expensive and less efficient plant. 3. The power company, having a market for current many times greater than the output of any individual waste heat station, can run such a station continuously at maximum output, so utilizing completely all the current that can be produced; whereas it is impossible to conceive the power requirements of an individual coke oven and colliery owner coinciding even approximately over 24 hr. with the amount of gas or waste heat available.

The accompanying diagram, which refers to Pease & Partners' installation at Crook, shows the advantage of co-operation very strikingly. It will be seen that the area of the rectangle inclosed between the top line and the base (shown hatched) represents the total amount of power available, that "hatched" (but not shaded) the requirements of the colliery owner, and that "cross-hatched" the amount disposable had the colliery owner put in his own plant independently, and been able to find a purchaser; it also assumes that the outside purchaser had approximately the same load curve as the colliery owner himself, which is a reasonable assumption, unless the power be transmitted long distances, as the only users of power in the vicinity of coke ovens are other colliery owners. The area shaded gray represents the surplus power actually used under the co-operative arrangement.

Co-operation Between Blast Furnace and Power Companies.

It is more difficult to get out so typical a curve in the case of blast furnaces, as the conditions vary so widely. Of course, if a company produces pig iron only, and does not convert the iron into steel, co-operation with a power company is at present, practically speaking, the only outlet which it has for its surplus power. If, however, a blast furnace works has a steel mill attached, it may be argued that the correct thing to do is to follow the plan adopted by many large works in Germany, namely, to install gas engine blowers and gas driven dynamos at the blast furnaces, the latter plant producing the necessary power for driving the steel mills.

In the case of the new works which the United States Steel Corporation are putting up at Gary, they are arranging to drive the whole of their steel works electrically, and they reckon to get all the power required for the steel mills from the blast furnace gas utilized in gas engines, of which they are installing 27,000 hp.; but—and this is an important consideration—they are putting down, to act as a spare to the gas engines, steam plant, the boilers supplying which can be coal fired. The resultant capital cost per useful horsepower of plant is therefore great, probably at least twice as much as it would have been had it been possible there to co-operate with a power supply company.

Capital charges are invariably the controlling factor in the total cost of electricity, and the question raised above, namely, whether it is commercially sound for a blast furnace owner to co-operate with a power company can only be decided in each individual case after full consideration of the capital outlay involved, the amount of spare plant that has to be provided, and the degree of coincidence between supply and demand. It is clear that if it be decided to make the works self-contained, then the supply capacity must always be in excess of the possible demand, otherwise a risk is run of a portion of the works having to be stopped, and as the demand varies from time to time there must be a variable amount of gas utilized involving wastage when supply exceeds demand, or the burning of coal at certain periods when demand exceeds supply. Given an equitable arrangement, it is clear that the same general arguments in favor of co-operation which hold in the case of coke ovens are applicable to blast furnaces with steel works attached. Referring to the operations of German blast furnaces a recent writer says:

> In spite of dull trade, the great works continue to make iron at almost the pace they set when the recent wave of prosperity was at its hight. The economies involved in the situation almost compel them to do so. To a considerable extent they have long term contracts for foreign ores for mixing with home ores; their coking ovens must continue in operation for the sake of the by-products, and the coke produced would deteriorate in quality if stored. But more than this, the furnace gases are needed for driving their steel mills, and it is often difficult to blow out a furnace or two without seriously disturbing the power supply.

It would therefore appear that even after a rough approximate balance has been secured between supply and demand it is readily upset by ordinary market fluctuations. The natural variation of trade thus furnishes a further argument in favor of the co-operative principle.

Co-operation in the Northeast Coast District.

To summarize briefly the work which has already been done in the utilization of surplus power, the first co-operative arrangement made by any of the power companies was brought about by the initiative of the owners of the Priestman Collieries, and resulted in the erection of the power station at Blaydon in 1905. At the present moment the three power companies named early in the paper have at work or in hand five waste heat stations, three in connection with coke ovens and two in connection with blast furnaces. Additional stations are under consideration.

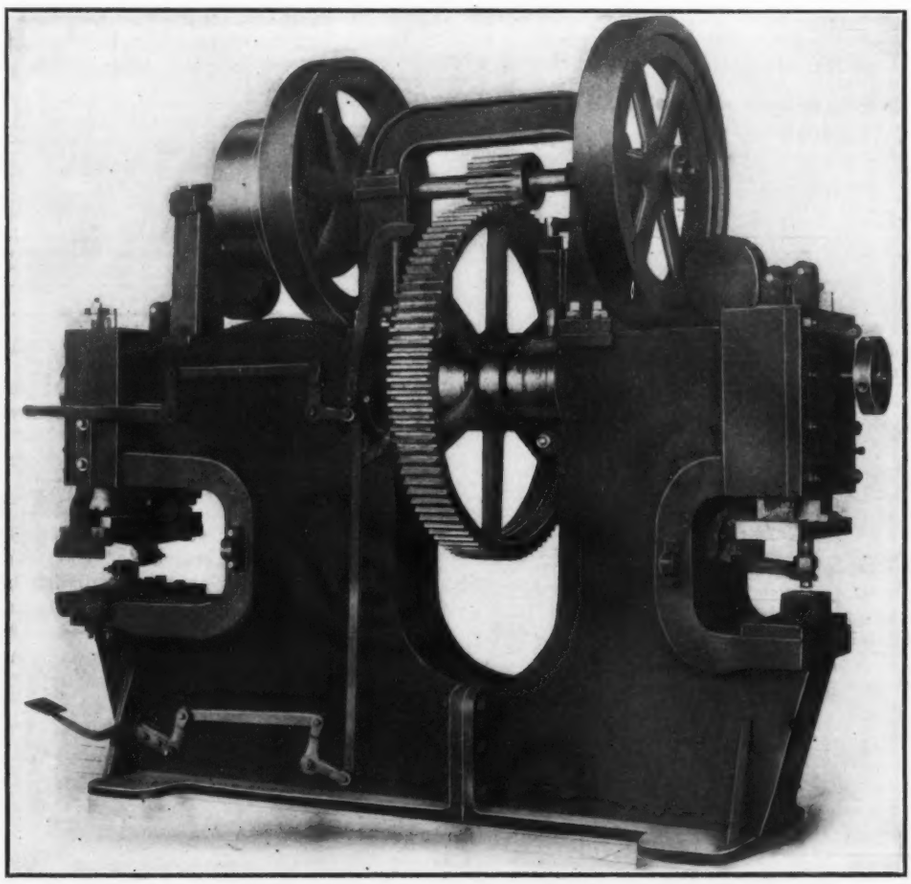
It will be remembered that as regards the Cleveland blast furnaces the calculations quoted dealt with the surplus available on the basis of the gas being utilized in gas engines, but the adoption of gas engines to the exclusion of all other types of prime mover still lies some distance in the future, and in the majority of cases in Cleveland it is found that steam blowing engines are used, and that after the requirements of the stoves have been met the gas is practically all expended in raising steam to supply these blowing engines.

To free any substantial quantity of gas for outside power-users would involve, therefore, the substitution of gas engines for the existing steam blowers. Considerations of capital expenditure usually forbid this course, and had it not been for the genius of Mr. Parsons, whose exhaust steam turbine provides another effective though less ambitious way of dealing with the situation, the Cleveland furnaces could not be regarded by a power company as an immediately available source of energy.

A Queen City Double Punch and Shear.

A new double end punch and shear, capable of punching a 2-in. hole in 1-in. steel, built by the Queen City Punch & Shear Company, Cincinnati, Ohio, is shown in the accompanying illustration. The machine is fitted with architectural jaws, so that I-beams can be punched, and is also arranged to handle flat bars of various size and to slit sheets or plates 1 in. thick. On one side it will cut to the center of a 48-in. circle and on the other side to a 24-in. circle.

Automatic stop clutches are used on both sides in which no springs are required, and these clutches will engage only at the will of the operator. The automatic clutches are so fitted that the downward stroke is arrested at any desired point and close to the work, insuring accuracy in punching. The gears are cut from solid metal, which insures smooth and noiseless operation,



A New Double Punch and Shear Built by the Queen City Punch & Shear Company, Cincinnati, Ohio.

which is a feature of all the machines built by this company. The shafts are made of hammered steel, and are turned true to an absolute fit. The plungers are balanced by weights to give square motion.

The machine illustrated was built for the Claussen Iron Works, Brooklyn, N. Y., and weighs 23,000 lb.

Danger from Ferrosilicon in Transit.

Allusion was made in *The Iron Age* of September 19, 1907, page 785, to the death by poisoning of four passengers on board a Swedish steamship, whose cabins were above a quantity of ferrosilicon packed in iron drums or casks and carried in the hold of the vessel. The theory was that as the iron ore and quartz used in the manufacture of ferrosilicon in the electric furnace often contain phosphates, these, in the presence of carbon and at the high temperature of the electric furnace, would be converted into phosphides, which would combine with lime to form calcium phosphide. In the same way any arsenic present would yield calcium arsenide. In a recently issued annual report of the Chief Inspector of Factories and Workshops of Great Britain, some space is given to the danger from ferrosilicon in transport. The giving off of poisonous gases is explained as above, but the explosions which have occasionally occurred are more difficult to explain. The following theories have been advanced by chemists: 1. In cooling suddenly from the high temperature of the electric furnace, the crystals of ferrosilicon assume an unstable and strained condition. On any sudden disturbance, these would fly to pieces with great violence. 2. The crystals of ferrosilicon contain water imbedded in them, which, on being exposed to a low temperature (the explosion occurred in winter), would freeze and expand, causing a sudden rupture of the mass. 3. The same electric furnace is often used for the preparation of calcium carbide and ferrosilicon. Some of the carbide might be left in the furnace during the manufacture of the ferrosilicon; the finished product would then contain some carbide, which in contact with water would evolve acetylene. 4. The explosions are due to a phosphoretted hydrogen. 5. It is conceivable that the ferrosilicon itself, under certain conditions, may be attacked by moisture in presence of CO_2, being decomposed into ferric carbonate and silico-methane (SiH_4). This latter is a gas, which is spontaneously inflammable and might easily cause an explosion in contact with air.

Since it is generally the belief of those who have investigated accidents with ferrosilicon that the presence of moisture is the primary cause, it is recommended that every effort be made to insure the dryness of the material when packed; also that no opportunity be left for the access of moisture to the receptacles containing ferrosilicon in transit.

A meeting of the mechanical section of the Engineers' Society of Western Pennsylvania was held in Pittsburgh on the evening of October 6. Joshua L. Miner, Easton, Pa., read a paper on the "Strength of Concrete Joints," and Chester B. Albree of the Chester B. Albree Iron Works, N. S., Pittsburgh, read a paper entitled "Simplification of Spring Formulæ."

A Gayley Dry Blast Installation.

The Refrigerating Plant of the Dry Blast Equipment of the Illinois Steel Company's South Works.

By the Gayley process the air required for combustion in blast furnaces and the Bessemer process is deprived of the greater portion of its moisture by cooling it far below its dew point. Its humidity is thereby rendered normal under any climatic or atmospheric conditions. scribed in the following article, which treats of an installation recently completed at the South Works of the Illinois Steel Company, Chicago. The refrigeration of the circulating fluid is accomplished by machinery and apparatus furnished and erected by the Vilter Mfg. Com-

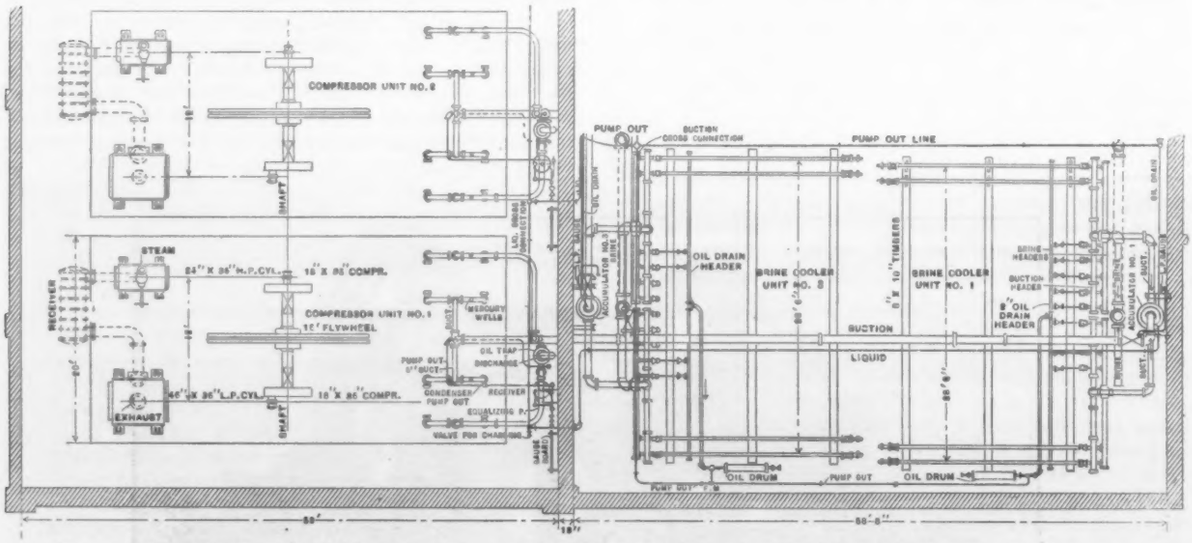


Fig. 1.—Plan of Half of the Refrigerating Plant of the Illinois Steel Company, Used in the Gayley Dry Blast Process.

pany, Milwaukee, Wis., with pumping engines supplied by the Fred. M. Prescott Mfg. Company, also of Milwaukee. The entire plant is installed in structures especially provided for the purpose, of which a plan and section are shown in Figs. 1 and 2.

The main building, 102 ft. long and 53 ft. wide, accommodates on its first floor, which is 40 ft. in hight, four refrigerating machines of 300 tons refrigerating capacity each. They are of the duplex horizontal type, each machine consisting of a cross compound condensing engine and two ammonia compressors placed opposite the high and low pressure steam cylinders and connected to the crank disks on the ends of the common

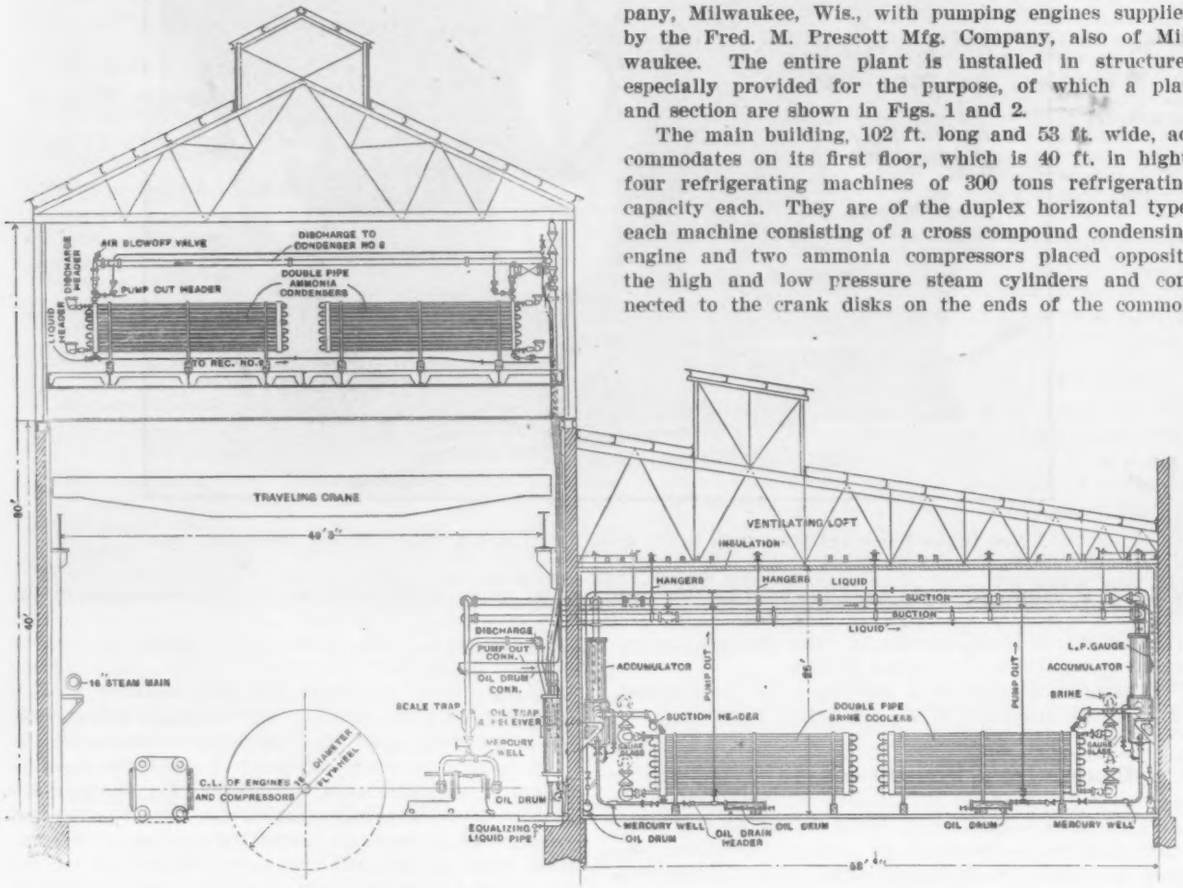


Fig. 2.—Section Through the Refrigerating Plant of the Illinois Steel Company.

The vapors thus eliminated by condensation collect on the surface of closely packed groups of piping along which the air is sweeping, and which are kept at low temperature by circulating through them a refrigerated solution of chloride of calcium. The arrangement of the cooling compartments or chambers and the manner in which the pipe groups are mounted therein are de-

shaft. The size of the steam cylinders is 24 x 46 in. by 36-in. stroke, while the ammonia compressors are of 18 in diameter and 36-in. stroke. The steam supply is furnished from one of the boiler plants of the works through a 16-in. main, the condensation of the exhaust being accomplished by a barometric condenser of the Weiss design.

The Cooling Apparatus.

The ammonia compressors are provided with a set of two suction and two discharge valves placed in each cylinder head and readily accessible. The gas discharged from the compressors passes through oil traps, of which one is provided for each machine, and enters the condensers which are placed on the second floor of the main building. The ammonia condensers are of the well-known double pipe type, consisting of 2-in. pipes 18 ft. long, with 1¼-in. pipes passing through them for circulation of the cooling of condensing water.

Twenty-five stands of such double pipe condensers, grouped 12 pipes high, as shown in Fig. 3, are provided for each machine. While the division into four separate units is strictly maintained throughout for obvious reasons, yet connections and valves are arranged in such a manner as to permit the operation of either two machines or all of them in combination on part or all of the ammonia condenser system.

The liquefied gas is collected in four receivers located near the oil traps and carried through individual pipes to the cooling apparatus, in which the liquid ammonia is evaporated by means of the heat transmitted to it from the circulating fluid employed for the refrigeration of the vast volume of air supply.

The cooling apparatus is installed in a building 68 ft. 4 in. long, 58 ft. 8 in. wide and 25 ft. in hight, which adjoins the engine room. The floor, walls and ceiling of this room are well insulated with a double lining of cork board 2 in. thick. The coolers are also of the double pipe type and set in four batteries of 20 stands each. Each stand consists of 12 3-in. pipes, connected in circuit, and 2-in. pipes passing through them. A saturated solution of chloride of calcium used as a circulating medium is forced through the inner pipes and transmits its heat to the liquid ammonia contained in the annular spaces formed by the outer 3-in. pipes. By abstracting the heat from the circulating fluid, the liquid ammonia—the boiling point of which at the working pressure employed in the apparatus lies between 5 and 10 degrees F.—is converted into steam or gas, which returns to the ammonia compressors to undergo again the process of liquefaction.

The Method of Distributing the Ammonia.

While the installation in its various parts barely presents any features which could not also be found in other modern applications of refrigerating machinery, it is the method in which the liquefied ammonia is handled and uniformly distributed to the great extent of the cooling apparatus which deserves special mention.

In usual refrigerating practice this is accomplished by needle valves or expansion cocks attached to the supply side of each stand of the cooling apparatus, and by which it is attempted to regulate the supply of the liquid refrigerant as it comes from the ammonia condensers so accurately that each stand receives its requisite amount of ammonia; that is to say, no more nor less than such an amount as can be converted into steam or gas by the heat transmitted to it from the entire heating surface of each stand, which is the aggregate area of the outer pipe surface of the 2-in. pipes of each cooler. Unless this condition is fulfilled there will be either a portion of the heating surface left ineffective for lack of liquid ammonia to which the heat can be transmitted, or more or less of the refrigerant will pass through the cooling apparatus in liquid state and return to the compressors, curtailing the capacity or efficiency of the latter.

As the refrigerating process is in principle nothing but a process of evaporation, where a fluid of very low boiling point (liquid anhydrous ammonia boiling at

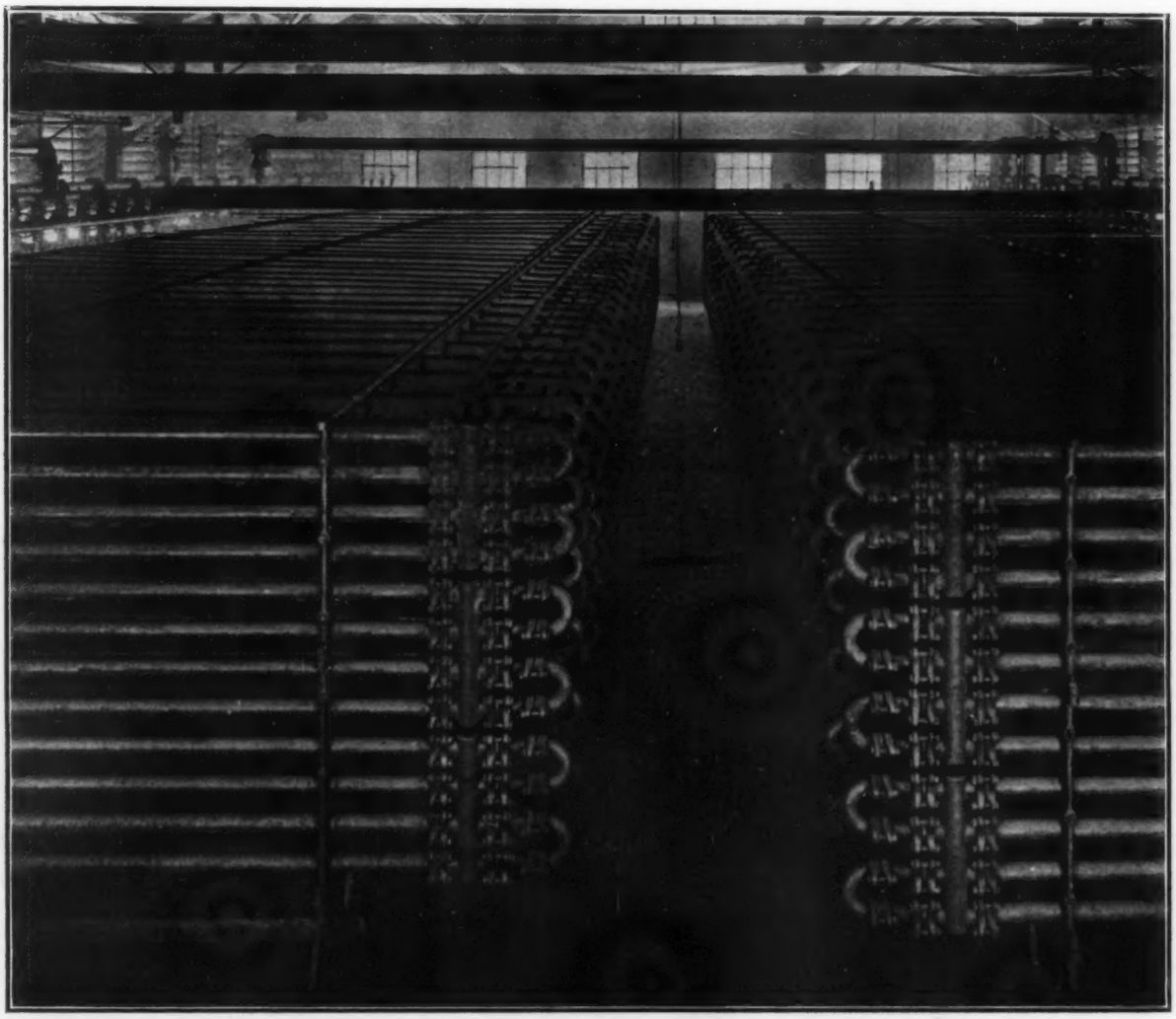


Fig. 3.—Typical Stands of Double Pipe Condensers in the Refrigerating Plant of the Illinois Steel Company.

29.6 below zero F.) is converted into steam by the heat transmitted to it from a fluid of a temperature higher than this boiling point, practically the same course is adopted in the refrigerating apparatus of the Illinois Steel Company's dry blast plant as that pursued in the universally known evaporating apparatus—namely, steam boiler practice.

How the Cooling Process Parallels Steam Boiler Practice.

The heat extracting (cooling) apparatus as built by the Vilter Mfg. Company under its patent, 894,285 of July 28, 1908, may be compared with any of the familiar types of horizontal water tube boilers, in which a group of tubes is connected to front and rear water legs carrying a common steam drum in which the steam separates from the entrained water, as follows: From an elevated receptacle called the accumulator, which is partly filled with liquid ammonia, the latter flows through a large pipe (the rear water leg of the boiler) communicating with the inlet ends of all double pipe coolers into the annular spaces (the tubes of the boiler) formed between the inner wall of the 3-in. pipes and the outer one of the 2-in. pipes passing through them. Here it is subjected to the effect of the heat transmitted through the walls of the 2-in. pipes by the circulating chloride of calcium solution (the fire and combustion gases of the boiler furnace) and converted into gas (steam). The gas and entrained liquid ascend and reach another large pipe header (the front water leg of the boiler) connecting all the outlet ends of the double pipe coolers through which they enter the accumulator (steam drum of the boiler).

In this drum the separation of the gas and entrained liquid takes place, the gas passing out on top through the main suction line to the compressor for reliquefaction, the liquid returning from the lower end of the accumulator to the double pipe coolers for renewed circuit.

It is evident that, through the adoption of this method of introducing the liquid refrigerant into the evaporating apparatus, only one supply valve is needed for each battery of 20 coolers or for all four batteries if it were not for the demanded division into four separate units in this case—in the same manner as a great many boilers may be supplied by one boiler feed pump. It is also evident that through this flow by gravity through a communicating pipe the liquid refrigerant is distributed to all coolers alike in such quantities as will not only suit the varying conditions of temperature of the circulating and heat transmitting fluid, but also insure the full use of the total evaporating surface of each cooler.

Making the Cooling Process Continuous.

To make the cooling process continuous, the ammonia gas generated in the coolers is returned to the accumulator after being reliquefied by means of compression and subsequent condensation. In doing so, however, one important feature upon which hinges the success of the entire procedure has to be observed. The process of liquefaction must necessarily be performed at the temperature of the cooling water which is available for the ammonia condensers. The liquefied ammonia returning from the condensers to the accumulator is therefore of much higher temperature and under much greater pressure than are maintained in the evaporating or cooling coils of the apparatus.

If the liquid refrigerant were liberated in this condition from the high pressure under which it is delivered from the condenser, its sensible heat at the high temperature corresponding to that pressure would be consumed at once in converting a part of such liquid into gas. This partial conversion into gas of every particle of the fluid would be an instantaneous, flashlike one and would not only cause the loss for effective refrigeration in the cooling coils of this portion of the fluid, but also a disintegration of the compact flow of the liquid in the same manner as if water is blown from the test cocks of the water column of a boiler under high steam pressure or as it emanates from the blow-off pipe. This spray of liquid would be carried along with the current of gas flowing from the accumulator to the compressors and, becoming unavailable for evaporation in the coolers, constitute a much greater loss in efficiency than the one alluded to heretofore.

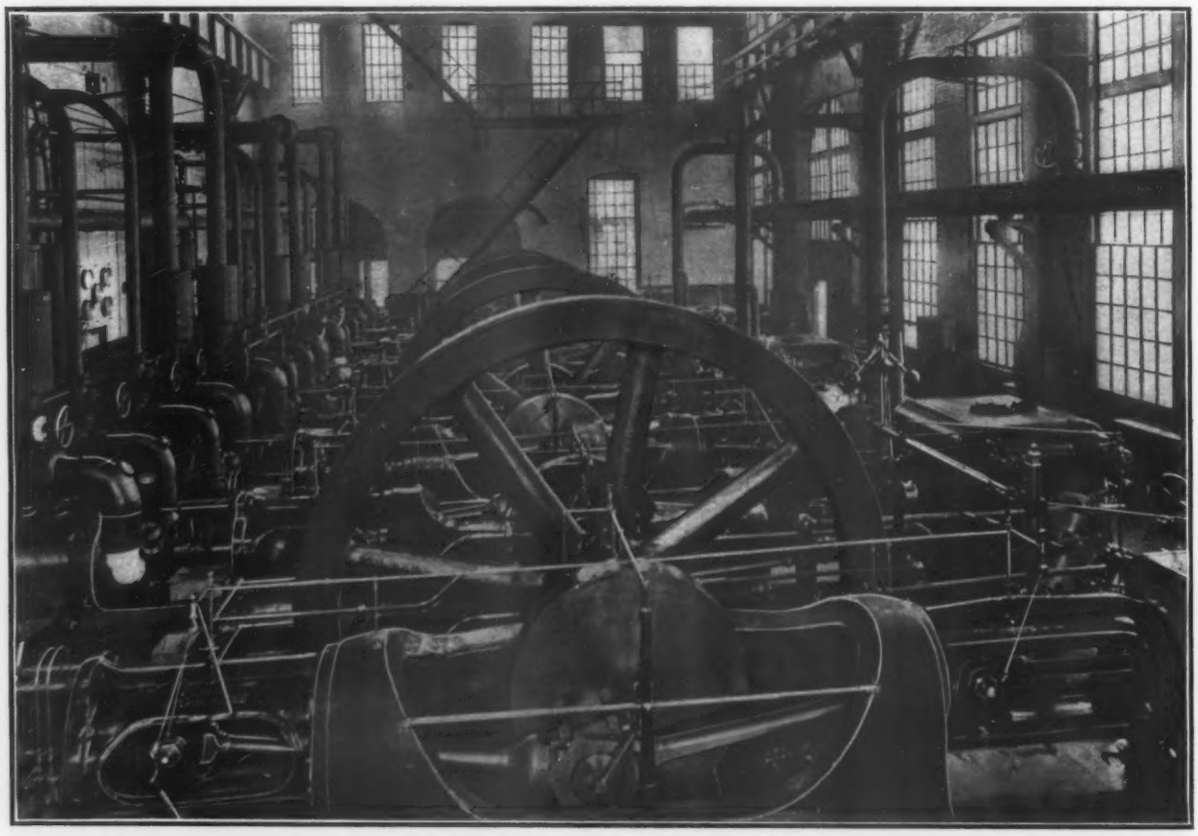


Fig. 4.—Engine Room in the South Works of the Illinois Steel Company, Showing Four 300-Ton Refrigerating Machines Built by the Vilter Mfg. Company, Milwaukee, Wis.

To prevent this loss it is necessary to deprive the liquid refrigerant of its excess of sensible heat before it is relieved of its high pressure and admitted into the accumulator. This is accomplished by the use of a long spiral coil suspended in the upper part of the accumulator and exposed to the current of the cold gas flowing to the compressors through which the liquefied ammonia passes before it reaches the relief valve which supplies each battery of coolers.

The Pumping Engines Used.

Fig. 5 illustrates the Prescott Corliss cross compound pumping engine, of which the Fred. M. Prescott Steam Pump Company, Milwaukee, Wis., furnished three for the special service of circulating the brine in the Illinois Steel Company's refrigerating plant at the pressure required by the Gayley dry blast service. Each pump has 12½-in. high pressure and 24-in. low pressure cylinders and 8¼-in. plungers, all of 24-in. stroke. The water ends are fitted with cast bronze plungers and Tobin bronze plunger rods, with all other parts made to withstand the action of brine. Each engine has a pumping capacity of 1200 gal. per minute at 120 lb. steam pressure per square inch. The system of piping used in the dry blast process brings about 25 lb. per square inch pressure on the suction, necessitating heavier suction piping and heavier sections in the suction parts of the pump barrels than in the usual pumping practice. These pumps have in each suction and discharge valve deck seven 4-in. valves, giving a total area of 70 sq. in. and the low velocity of 2.8 ft. per second through the valve seats. It was further necessary, on account of the low temperature of the brine, to take particular care to avoid shrinkage strains in the castings for the water ends. For the same reason considerably more metal was allowed in the sections.

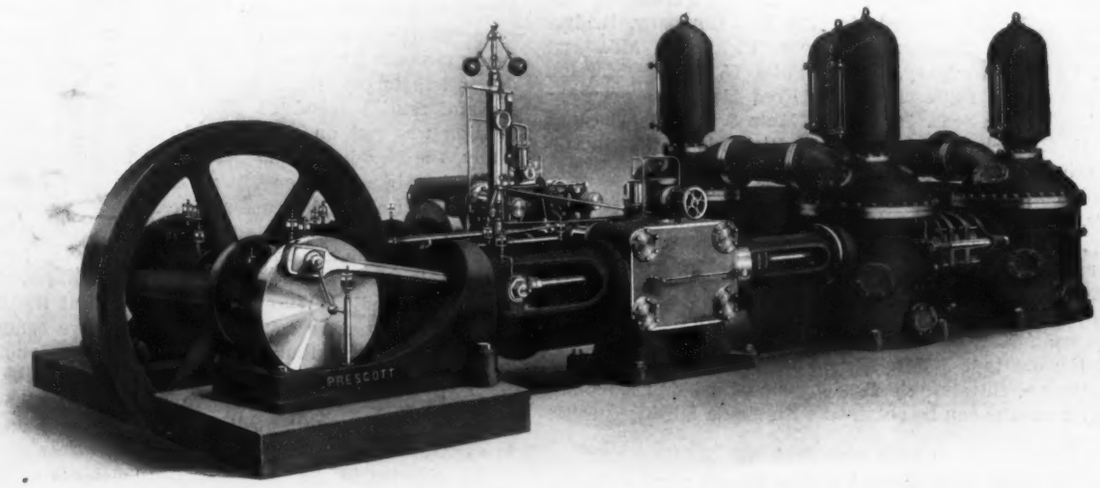


Fig. 5.—The Prescott Corliss Cross Compound High Duty Pumping Engine Used in the Refrigerating Plant of the Illinois Steel Company.

The machinery installation was commenced the middle of March this year and was completed May 5. It proved successful from the beginning and has been operated throughout the summer, exceeding in its performance by far the guarantees to which the builders had submitted in their contract with the Illinois Steel Company.

The progress being made in the introduction of gasoline locomotives for service in industrial plants is illustrated in a statement made by the Sierra Nevada Wood & Lumber Company, Hobart Mills, Nevada County, Cal., respecting an engine of this kind furnished by the Milwaukee Locomotive Mfg. Company, North Milwaukee, Wis., for use in its yards. From 150,000 to 160,000 ft. of lumber per day, it is stated, is being handled by this engine in a very satisfactory manner. One of the advantages noted is that the range of speed and power afforded admits of taking a few cars very quickly to their destination, or a heavier load more slowly, as is required. The consumption of gasoline for work extending over 10 hr. per day is between 5 and 6 gal. The ease with which the machine is handled and its freedom from breakdowns are also points upon which favorable comment is made.

Canadian Industrial Activities.

TORONTO, October 3, 1908.—The works of the Montreal Reduction & Smelting Company at Trout Lake, Ontario, 100 miles south of Cobalt, are now about ready to be put in operation. It is two years since the corner stone was laid by the Ontario Minister of Lands, Forests and Mines. The plant is for the exhaustive treatment of ores and matte containing gold, silver, cobalt, zinc, tin, copper, lead, bismuth, antimony, nickel, &c. Eight smelting furnaces and two large roasters are installed. Twelve different processes are provided for. Of the machinery installed, 175 tons was made in Canadian workshops, and 500 tons was imported. The situation is admirable for receiving and shipping purposes, as the works are on three railroads. G. W. Wallace, Detroit, Mich., is president of the company; George R. Adams, Bar Harbor, Me., vice-president; Colonel T. H. Rogers, Detroit; John Stein and C. L. Towly, Duluth, are directors. With these are associated Montreal men of capital.

The Ontario Power Company at Niagara Falls has let the contract for the extension of its power house. When the new units are in operation the capacity will be 95,000 hp., which is an increase of 25,000 hp. on its present limit. It is with this company the Ontario Hydro-Electric Power Commission has contracted for the supply of power the commission will carry to the municipalities over the transmission system it has just arranged to have constructed. The commission has just opened the tenders for the electrical equipment of the twelve transformer stations and the step-up station on its line. No award has yet been made, but the chairman says the tenders came below the estimate of $1,107,000.

Improvements in the Helen mine plant of the Lake Superior Corporation are being made. Electricity will be largely used. A hydro-electric plant is to be built at the fall on the Michipicoten River by the Algoma Power Company, and from this the motors of the mine will be driven. The contract for the equipment has been given to Allis-Chalmers-Bullock, Ltd. C. A. C. J.

The Renolds Chain Works.

From a report by Special Agent Capt. Godfrey L. Carden to the Department of Commerce and Labor the following account of a visit to the Renold Works at Manchester, England, is taken:

The guiding spirit of this well-known plant, Hans Renold, is a Swiss by birth and education, who derived his engineering instruction from the University of Zurich. Some 30 years ago, assisted only by one man and a boy, he commenced the manufacture of chain in Manchester for use in textile machines. From this small beginning, in a single rented room, the business grew, until to-day the Renold Works comprise a floor space of more than 7 acres in extent and furnish employment for about 700 people.

Many American Machine Tools Used.

The reputation of this firm is for work of a high degree of merit, and it was reasonable to assume that only the most accurate and efficient tools would be found, which assumption was fully borne out by observation. The number of Brown & Sharpe tools in use suggested a shop equipped with tools of that American firm. Other fine American made tools were in evidence, but in point of numbers the equipment was mainly from Providence, R. I. In addition to Brown & Sharpe machines I observed tools from the F. E. Reed Company, Worcester, Mass.; National Machine Tool Company, Tiffin, Ohio; Hurlbut & Co., South Sudbury, Mass.; Flather & Co., Nashua, N. H.; Bullard Machine Tool Company, Bridgeport, Conn.; Dietrick & Harvey, Baltimore, Md., and M. F. Mfg. Company, Millers Falls, N. Y. The foreign makers were represented by Alfred Herbert, Coventry; John Lang & Sons, Johnstone; Muir & Co., Manchester; J. E. Reinecker, Chemnitz, and Richards & Co., Broadheath, near Manchester.

I observed a 10-in. Hurlbut cutting off machine in use. Mr. Renold informed me that he would like to have secured a machine of this type for 14-in. work, but so far as he knew Hurlbut made no machine larger than the 10-in. size. Mr. Renold spoke highly of a new Bullard boring mill and declared that he could do about 30 per cent. more work with this new tool than with one of the old types. Mr. Renold is inclined to think that in the present state of development of hobbing machines better results can be obtained with single milling cutters.

Chain Belt Making.

The chain making work at the Renold plant calls for much automatic service, and, speaking roughly, I should say that there are at least 200 automatic machines of a medium size in service here. This refers more especially to the machines furnished by Brown & Sharpe and Alfred Herbert.

Messrs. Renold, after branching out from work in connection with textile machinery, took up the business of supplying chain for cycles, and latterly this firm is making a specialty of manufacturing chains for driving machine tools. It is the opinion of Messrs. Renold that a chain can economically replace ropes and belts, and in the new Renold plant chain driving is employed to an astonishing extent. Three types of chain are made—namely, block chain, roller chain and silent chain. The block chain may be run at speeds up to 500 ft. per minute and in larger sizes is used more especially for conveyor and elevator works. In the smaller sizes it is applied to feed drives on machine tools and the like. Roller chain has the rivet surrounded by a steel brush on which is a roller which actuates the sprocket teeth. Roller chains may be run up to 900 ft. per minute and are made from ½ in. pitch upward, in many hundreds of sizes. They are used in cycles and motor vehicles and also for machine driving. The silent chain is designed for high speed, and drives even when worn out, it is said, with the swiftness of a belt. In a modern form of this chain segmental hardened bushes are fixed in the hole of each row of links and bear on hardened pins, the hole in the alternate links being recessed on one side to clear them. The silent chains are capable of running up to 1250 ft. per minute, and even faster, it is said, when special oiling provision is made. It is claimed that 500 hp. can be transmitted with silent chain, and larger sizes, I understand, are now being developed. The manufacturing operations in connection with these chains are carried out with minute exactitude.

Increased Output from Chain Belt.

The new works of Messrs. Renold are driven only by electric power and all the motors in the shop are similar and interchangeable. They claim that by means of chain belt the output is increased by over 20 per cent., and using Brown & Sharpe tools during a trial lasting 138 hr. a chain driven machine yielded 3074 rollers, as against 2485 rollers obtained from a belt driven machine. It is also claimed that the work obtained from the chain driven machine was considerably better. It is hard to account for the difference of the quality of the work, but Messrs. Renold say the belt, when hard driven, slips more or less irregularly on the smooth surface of the cone, accompanied by an alternate elongation and contraction, causing a pulsating turning. It is also claimed that only 25 per cent. of drills are necessary with the chain driven machine, and that one operator can easily attend six chain machines as against two belt driven. Only 25 per cent. of the number of grinding machines was required for keeping the tool sharp, and the wear and tear on spindle and counter shaft bearings was, it is said, considerably reduced.

Messrs. Renold say that during this test it was found on the chain driven machine that by giving the 1-in. bar a circumferential speed of 75 ft. per minute they obtained the best results in drilling and parting, these being the two chief operations of the belt driven machine. No satisfactory work, it is said, could be secured with a circumferential speed of 75 ft. per minute, whatever tension was put on the belt. In addition to the foregoing, the broad claim is made that larger and heavier work than is possible on belt machines can be done satisfactorily on chain driven machines. Messrs. Renold explained that in their catalogue they clearly state that while the spindle has 1-in. bore it is only meant for brass of this size, and if used for steel only ⅞-in. bar should be used. It will be observed, therefore, that the Brown & Sharpe tools were worked under excessive conditions. Evidently Messrs. Renold appreciated the capacity of these tools, and it is interesting to note that in the automatic turning department there are no less than 163 Brown & Sharpe small, medium and large sized machines in service.

In addition to the 200 automatic machines of American and English make on the Hans Renold floor, there are over 200 automatic and semiautomatic machines of special types, which are of Hans Renold design and construction. This latter machine serves as special in the manufacture of driving chains.

Attractive and Sanitary Shops.

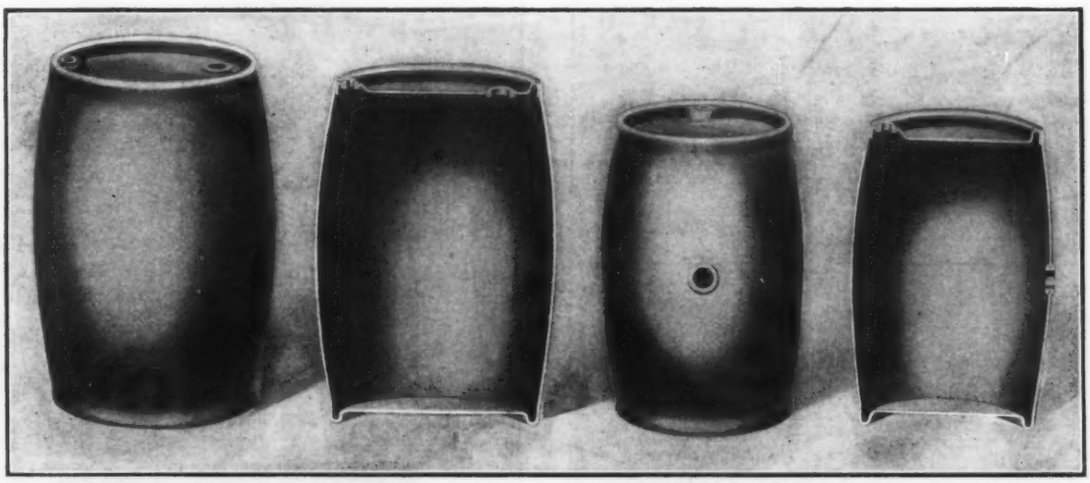
There are few machine tool works in Europe which present so pleasant an aspect to the visitor as the new Hans Renold Works. The location of the recently erected building is in the suburbs of Manchester, with open fields, pleasant driveways and shady trees marking the approach. The main building is artistically designed and lacks those somber features which generally characterize a manufacturing building. The interior of the main shop is well lighted, and great care and attention has been bestowed upon the sanitary arrangements. I should say that it is impossible for water to collect, and there appears to be an excellent drainway from all directions. For the most part the floor is of timber, while the building itself is of steel, brick and concrete construction. There are a large number of women and girls employed in this plant, their work being mainly in connection with stamping machines and work of a special nature.

Messrs. Renold have aimed to make the workshop attractive for their employees, and have gone to greater length than I have so far witnessed in the United Kingdom. English shops are subject to inspection, but the requirements for the protection of workers at tools do not seem to be so rigid in the United Kingdom as in Germany.

Pressed Steel Barrels.

For several years steel barrels have been used as containing packages for storing and shipping oils and other liquids, but these had seams in the body which it was realized should be eliminated for the sake of security and durability. Many efforts have been made to produce a seamless steel barrel with a bilged body, which demonstrated the mechanical possibility of such a product, but also developed obstacles in the way of its commercial practicability. After prolonged experimenting, during which machinery and processes were perfected, the Pressed Steel Tank Company, Milwaukee, Wis., is now prepared to turn out seamless steel barrels of bilge form in three sizes, as shown in the accompanying illustrations.

This barrel is formed from a single piece of open hearth steel by a series of operations in hydraulic presses of special design, and with the exception of the upper head, which is hard brazed to the inturned edge of the body, it is wholly seamless. The bungs and vent holes are reinforced with ring plugs of rivet steel upset in place under a 200-ton hydraulic riveter, as shown in the sectional views, and are firmly brazed to the shell to avoid loosening and leaking. For the bung and vent openings cast iron shoulder plugs are supplied, 2 in. and 1 in. in diameter respectively, but wooden bungs can be used if desired, in which case the reinforcements are reamed to suit the standard market sizes.



Exterior and Sectional Views of Two Sizes of Steel Barrels Made by the Pressed Steel Tank Company, Milwaukee, Wis.

The packages are made in three standard sizes, as follows: 15¾ gal. capacity, 16¼ in. largest diameter by 23¼ in. high, weighing 45 lb.; 31½ gal. capacity, 20½ in. in diameter by 29¼ in. high, weighing 80 lb., and 52 gal. capacity, 24¾ in. in diameter by 33¼ in. high, weighing 100 lb. They are furnished lined or galvanized inside and out or painted with asphaltum japan. Before leaving the works a hydraulic and air test of 50 lb. per square inch is applied to each package.

The work involved in the production of these barrels is suggestive of the marked advance that has been made in recent years in stamping and drawing sheet steel.

The bibliographical catalogue of the books, pamphlets and periodicals of the celebrated Latimer-Clark collection presented by Dr. Schuyler Skaats Wheeler to the American Institute of Electrical Engineers, has been completed and is about to go to press. This critical catalogue has been in preparation for the past six years under the direction of W. D. Weaver, with the collaboration of Brother Potamian of Manhattan College and a number of other authorities here and abroad. The expense of this unique work has been defrayed by Andrew Carnegie. As soon as the book comes from the press it will be distributed to the members of the Institute, who, according to the deed of gift of the library, are entitled to the catalogue.

British Enterprise in Seizing Unworked Patents.

The London *Morning Post* publishes the statement by a member of Leopold Farmer & Sons that a number of well-known English firms, representing a large amount of capital, are understood to be forming a company for the purpose of opening works at once to produce those articles patented in England by foreign manufacturers, the patent rights of which, according to the new law, have lapsed. No pains are to be spared before operations to manufacture are commenced, to ascertain that the foreign patentee has forfeited his right, and that the patent has been automatically canceled by the provisions of the act, and that therefore he could not gain time or redress in the courts.

With regard to the English firms interested in this combine, the informant of the *Post* said he was not prepared to mention the names, but hoped to be able to do so in due course, and the names would no doubt show that those concerned in the matter were well versed in questions relating to patents, and able to decide that their action was a right and proper one in the interest of the general public. He added that the movement among towns and districts to attract manufacturing industries had been given an impetus by the new act, and by the authorization to spend the money of a town in advertising for that and similar purposes. The movement had probably been most prominent in the northeast of England, where it was inaugurated by the commercial agency of the Northeastern Railway Company, who at first induced the principal districts to move in this direction, and whose example had been followed by other towns. A considerable number of manufacturers are extending their premises in order to deal with additional manufactures carried out by arrangement with foreign patentees who do not propose to establish works in Great Britain, and this is notably the case in the northeast of England.

Industrial Pittsburgh.—Under this title the Union Trust Company, 335 to 339 Fourth avenue, Pittsburgh, has issued a most artistic pamphlet of 62 pages, illustrated with views taken among the varied industries of that city. The illustrations are those of typical processes in a rail mill, armor plate plant, bathtub foundry, rod mill, electrical machine shop, plate glass factory, locomotive works, steel car plant, wire fence factory, bridge works, wire nail factory, projectile factory, pipe mill, &c. The engravings are presented on tinted paper. The text of the book treats of the great extent of the industries and commerce of the Iron City. The Union Trust Company is one of the great financial institutions of the country, having a capital and surplus of $26,000,000. Among its directors are the names of such well-known men in the iron and steel trade as H. C. Frick, B. F. Jones, Jr., E. C. Converse, William B. Schiller, Thomas Morrison, Henry Phipps, William G. Park, H. C. Fownes, D. E. Park, James H. Lockhart, J. M. Lockhart and J. M. Schoonmaker.

The Jorn Sand Blast Apparatus.

After several years of experimenting, A. Jorn, Jr., Waukegan, Ill., has developed and is now manufacturing the sand blast apparatus shown in the accompanying illustrations. It is believed to be one that will appeal to metal and glass workers because of its simple and durable construction and easy operation. Since the machine itself collects, screens and returns the sand for repeated use (except that which is lost as dust through the exhaust pipe) frequent stops for recharging are eliminated. A greater range of work and more accurate work it is claimed can be done with this apparatus than with a hose sand blast. The standard 18-in. size will sand blast an area of from 150 to 180 sq. ft. an hour.

The sand is supplied from a hopper, near the delivery end of which is a grooved roller which rotates while the apparatus is in use and drops charges of sand in the path of an air blast delivered into the nozzle in a direction to carry the sand through the mouth of the nozzle and into contact with the articles to be cleaned. The nozzle provides means whereby the sand blast may be limited to a circumscribed area. After the sand has been projected upon the work, it is conveyed to the hopper to be used over again repeatedly.

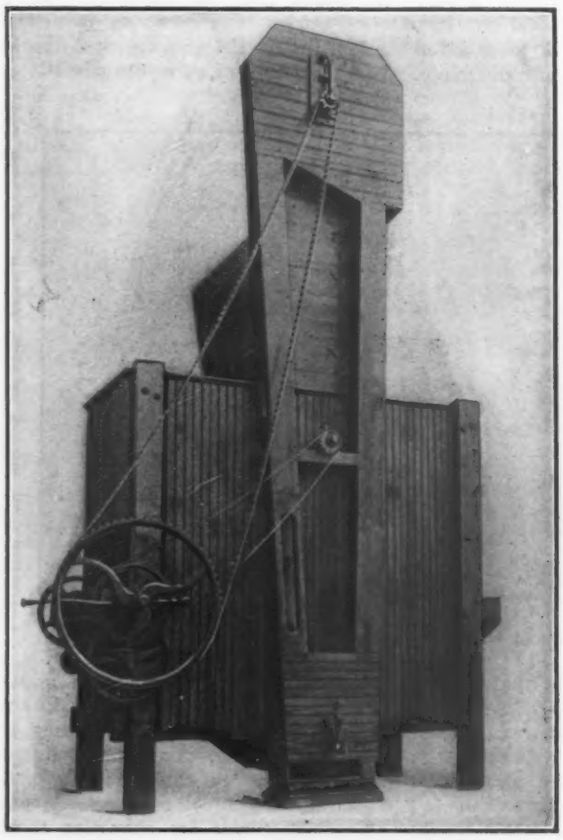


Fig. 1.—The New Sand Blast Apparatus Built by A. Jorn, Jr., Waukegan, Ill.

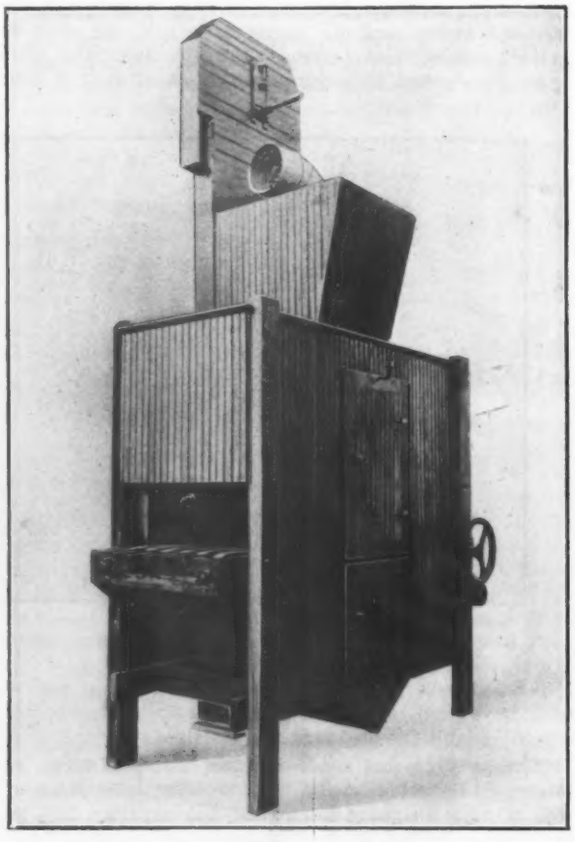


Fig. 2.—Another View of the Jorn Sand Blast Apparatus.

The accompanying Figs. 1 and 2 show exterior views of the apparatus, and Fig. 3 shows it with the inclosing sides removed, and also gives a detail in section of the blast nozzle and sand feeding device. As may be seen from Fig. 3, there is a main frame supporting another frame at the ends of which are journaled transverse shafts carrying rollers. These rollers carry endless belts upon which the articles to be treated are placed. The sides which inclose the frame are protected by a rubber lining, and the belts are also of rubber, as is usual in sand blast apparatus.

Below the belt frame is a receptacle having a bottom inclined toward the center, where it discharges into a trough containing a screw conveyor leading to the bottom of a bucket elevator. The latter delivers the sand through a spout into a hopper fastened on the platform carried by the frame. Below the platform and the hopper is a sheet metal receptacle, with an opening in the top communicating with a chamber inclosed by vertical parallel walls. The lower ends of the walls approach each other to form a contracted throat, and within the chamber above this throat is a drum with a circumferential series of horizontal grooves. The drum is mounted upon a shaft having bearings in the end walls of the casing, and at one end this shaft is driven by a chain from the main driving shaft. A deflector above and a lip bearing against the side of the drum, direct and limit the flow of sand into the throat, except as allowed by the rotation of the drum. Assuming the rotation to be continuous, each groove will carry a charge of sand from one section of the compartment to the other, and a continuous series of charges will gravitate through the throat.

Between the outer walls of the casing are chambers on each side of the sand compartment. The outer walls also approach each other toward their lower ends, thus forming other throats on each side of the sand chamber throat. An opening through the top of each chamber is connected with a bifurcated pipe, which supplies air under pressure. Below the throats is a nozzle, the walls of which approach each other toward the discharge end. One wall is hinged at its upper end, so that the area of the discharge may be regulated.

When the hopper is charged with sand and the conveyor, the elevator and the drum are in properly timed movement and air is fed under pressure through the conduit, the articles to be cleaned are placed upon the belts and are slowly conveyed beneath the open end of the nozzle. The streams of air entering the outer chambers pass forcibly through the throats and into the nozzle, taking up the sand, projecting it against the work as it passes slowly under the lower end of the nozzle while resting upon the belts. After the sand has performed its work it falls through the spaces between the belts, and finally into the trough where it is carried by the conveyor into the lower end of the elevator, to be carried to the top of the latter and delivered again into the hopper through the spout.

The size of the stream passing out through the nozzle

and, in a measure, the speed of the stream of sand laden air may be regulated by adjusting the nozzle opening, and this may be done while the air pressure in the pipe is being maintained practically constant. The same source of power drives the various parts, including the blower by means of which air pressure is maintained, and consequently it is advantageous to regulate the force of projection of the stream of sand laden air by constricting or expanding the nozzle opening rather than changing the air pressure by varying the speed of the blower. By adjusting one side of the nozzle so as to vary the relative inclination of the nozzle sides, there is practically no abrasive action of the sand upon the walls.

While the machine is especially adapted for cleaning castings, it may be used for sand blasting glass either in

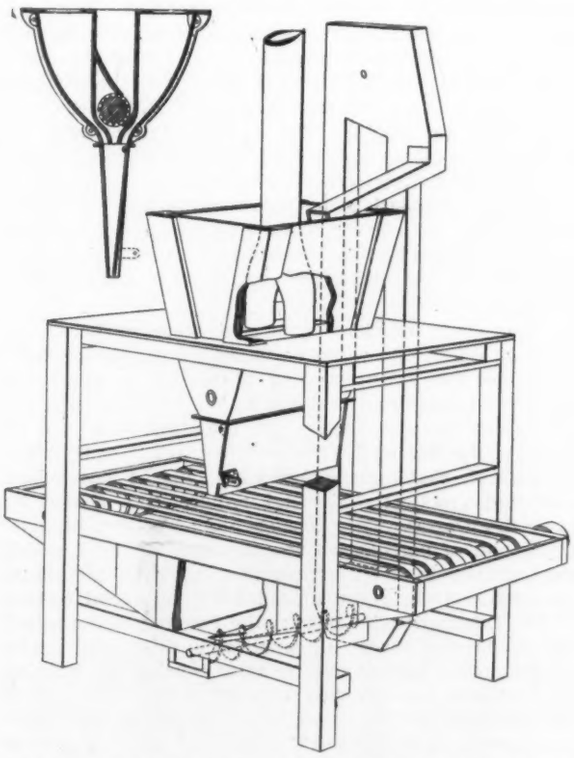


Fig. 3.—Sketch of the Apparatus with the Sides Removed and Detail Section of the Nozzle.

plain or in ornamental designs, or may be used for numerous other purposes for which sand blasting apparatus is adapted.

The Colonial Steel Company.—Stockholders of the Colonial Steel Company, Pittsburgh, works at Monaca, Pa., met in Pittsburgh September 28 and increased the capital stock from $1,250,000 to $2,000,000. The new stock will be 7 per cent. preferred and will be largely used for the purpose of developing a new patented product of the company, based on welding copper and brass to steel. The copper and brass may vary in thickness corresponding to the uses desired by the consumer, and this does not affect the quality of the welding process. A combination product can be made for stamping and drawing which has more rigidity and strength than can possibly be given to ordinary brass and copper. It can be adapted to such purposes as rods or tubing made from strips and is especially suitable for making bedsteads. J. B. Findley and A. S. Beamer were elected directors, the number being increased from five to seven. The plant of the company at Monaca is running to nearly full capacity, and some additions are contemplated when normal conditions in business warrant.

The October *Monthly Pipe Parley* of the McWane Pipe Works, 220 Broadway, New York City, presents on its front cover a view of the top section of a cast iron lighthouse, which one of its foundries has just completed for the United States Government. The hight of this section is 42 ft., the diameter at the top is 40 ft. and the weight is 186 tons.

Conservatism to Govern Tariff Revision.

WASHINGTON, D. C., October 6, 1908.—As the preliminary work of tariff revision by the Ways and Means and Finance committees proceeds it becomes daily more apparent that the changes are to be made along very conservative lines, and especially that the Senate leaders will be disposed to hold in check any movement looking to radical revision or to important changes in the principles underlying the Dingley act. The most significant work thus far accomplished has been that of the sub-committee of the Finance Committee, which has been investigating the necessity of amending the classification of the Dingley law and of modifying numerous provisions of the customs administrative act of June 10, 1890. A member of this sub-committee, in reviewing briefly the inquiries made during the past month, said to the correspondent of *The Iron Age:*

While the inquiries of this sub-committee have been directed chiefly to questions of classification so far as they relate to the Dingley act, yet we have received considerable information regarding the general revision of the tariff, and I think I express the views of the entire sub-committee when I say that we have been surprised to note the great conservatism of those who are seeking changes in rates or modifications of classifications, the effect of which would be either to reduce or increase present duties. The fact seems to be that there is very little demand for specific reductions in the tariff, and that demand seems to be confined to a relatively small number of manufacturers who desire that their raw materials shall be cheapened, but who are unwilling to surrender any part of the protection afforded by the Dingley act to their finished products. These manufacturers place great emphasis upon the necessity of reducing the cost of production, so that they may compete with their foreign rivals in the principal markets of the world, but they entirely lose sight of the fact that the raw materials of their industries are often, and in fact nearly always, the finished products of other domestic industries which are just as much entitled to protection as any producers in the country. I do not look for the development of a general policy of free raw materials among the majority leaders of either House or Senate, for it goes without saying that it is just as necessary to protect the labor that develops our natural resources by digging products out of the earth as it is to assist the labor employed in working up these products in our mills and factories.

The further we go with this investigation the more fully are we convinced of the great ability displayed by the framers of the Dingley act and, in my opinion, there will be no change in the principles underlying that act and only a slight readjustment of rates. In fact, I think the most laborious task that will be encountered in connection with the coming revision will be the rearrangement of the tariff on a maximum and minimum basis if, as now seems probable, that plan is finally adopted. I assume that the Dingley rates, with a few modifications, will be adopted as the minimum tariff and that the maximum will be fixed by adding certain percentages thereto. If the plan followed by the leading European countries maintaining double column tariffs is adopted as a pattern, the additions to the minimum rates will not be uniform, but will be so adjusted as to put the United States in the most advantageous position possible for the negotiation of reciprocity treaties, the purpose of which will be quite as much to protect our commerce against discrimination as to secure larger markets for our surplus products.

Treasury officials are greatly encouraged over recent tendencies in the Federal receipts and expenditures, which, if maintained during the remainder of the fiscal year, will relieve Congress of the necessity of providing new sources of revenue. A statement made on October 1 and covering the first quarter of the new fiscal year shows a deficit of $33,364,000, as compared with a shortage of only $4,415,000 a year ago, but only $4,585,000 of this deficiency is chargeable to the month of September, during which there was an unexpected and highly gratifying increase in both customs and internal revenue receipts. The continuance of this improvement throughout the year would very nearly wipe out the balance on the wrong side of the ledger, and would have an important bearing upon the work of Congress in the revision of the tariff and internal revenue laws.

W. L. C.

The Patent and Trademark Congress.

The Recent International Meeting at Stockholm.

WASHINGTON, D. C., October 6, 1908.—That the British Government in the near future will repeal the recently enacted law requiring the working of patents within a limited period to prevent their invalidation, and that the movement in the United States and other countries looking to the adoption of a similar requirement will make no further headway, is the opinion of leading experts in patent law who attended the meeting of the commercial section of the International Congress for the Protection of Industrial Property held at Stockholm, Sweden, August 26 to 29. The American delegate to the Congress was the United States Commissioner of Patents Edward B. Moore, who recently returned to Washington. The functions of the commercial section of the Congress are limited to the framing of recommendations, which will be laid before the official section at its next annual meeting, which will probably be held in this city in the summer of 1909. Referring to the discussion of the new British patent law at the Stockholm meeting, Commissioner Moore said to the correspondent of *The Iron Age:*

British Working Clause.

No subject was discussed at Stockholm with greater interest than the effect of the recently enacted British law requiring patents to be worked in England within a certain length of time. The general consensus of opinion was that Great Britain had taken a step backward, and I am free to say that I fully concur in this view. The most important result of the English law thus far has been the transplanting from Germany to Great Britain of portions of certain industries, notably those engaged in the manufacture of chemicals, drugs, &c.; but while this would seem to be an advantage secured under the new law, it is the opinion of experts that in the long run the statute will prove injurious, in that it will discourage the work of English inventors. If a patent must actually be worked within three or four years in order to protect it, inventors and patent owners will often be obliged to sacrifice the greater part of the pecuniary value of the patent by forcing its exploitation at an inopportune time. It often happens that discoveries are made, sometimes accidentally, which are far in advance of the practical development of the industry to which they relate. They cannot possibly be developed on a commercial scale within the statutory period, but under the English law the inventor must choose between imperiling his property right in the invention by taking out a patent on it or assuming the risk of having his ideas stolen or the same principles discovered by another inventor by relying on secrecy. In many cases inventors who have been unable to secure capital to exploit their inventions commercially will be obliged at the last moment to sell them for a song to prevent the invalidation of their patents.

In the discussion at Stockholm it was developed that German manufacturers feel that they have been seriously injured by the operation of the new British law, but, of course, the defenders of that statute call attention to the fact that Germany has a similar requirement. In retort, however, the German officials assert that their law is rarely enforced. Again, when the English law is assailed by American experts, the answer is made that the United States, by its high protective tariff, accomplishes practically the same object as that aimed at in England. While this contention is fallacious, it is urged with much vigor in defense of the British working clause.

That Great Britain will find it advisable to repeal the working clause was the opinion very generally expressed at Stockholm, although it is not to be expected that the extent to which inventive genius will be discouraged by the existing statute will at once be appreciated. It will not be long, however, before the government itself will begin to suffer by reason of the obstacles placed in the way of inventors who have given their attention to the development of war materials of all kinds, including ships, guns, projectiles, ammunition, &c. The market for such inventions is narrow, at best, and if the law requires them to be practically worked within a very few years after being patented, inventors will find themselves seriously embarrassed, and will be exceedingly apt to turn their attention to other and more profitable fields of discovery.

Our Trademark System the Best.

The congress was attended by 400 delegates, representing 24 countries, and including the official members of the congress bearing governmental credentials and the unofficial members, representing the leading industries of the most important commercial countries of the world. The chief topics considered were the harmonizing of the patent and trademark laws and procedure of the countries adhering to the international convention for the protection of industrial property and the extension of the protection of trademarks and patents as industrial property of the highest value.

With regard to trademarks, the work of the congress was especially significant from the American standpoint, as it consisted chiefly in emphasizing the desirability of harmonizing the laws and practice of other countries with the system already adopted in the United States and the necessity for the negotiation by the principal countries of such trademark treaties as those which the United States recently concluded with Japan for the protection of trademarks in China, Korea and other countries in which the signatory powers now exercise or may hereafter acquire extraterritorial jurisdiction. With respect to trademark practice and also in the extension of trademark protection to extraterritorial jurisdictions, the United States is rather ahead of the rest of the civilized world, and it is gratifying to observe that the older countries of Europe, with their long industrial experience, are accepting our laws and regulations as patterns for the amendment of their own statutes and general practice. Other recommendations by the congress have for their object the standardizing of the requirements of the patent offices of the leading industrial countries with respect to applications for trademark registration, general office practice, &c.

The recommendations of the commercial section of the congress relating to patents concern chiefly the administration of the patent laws of the countries which are parties to the international convention. Many diverse requirements are now made under the rules of the patent offices of the leading foreign countries, and it seems highly desirable that these differences should be harmonized and that practically identical requirements should be made in all cases. The exchange and acceptance of certified copies of patents are now governed by rules which vary greatly in different countries, and the Stockholm convention strongly recommended to the official section of the International Congress the framing of a general rule that would govern all countries in this matter. The adoption of a harmonious series of regulations covering applications, registrations, certified copies, &c., would greatly facilitate the protection of inventions and trademarks throughout the world and would decrease the expense which must now be borne by inventors and patent and trademark owners.

W. L. C.

Railroad Rates Reduced by Decree.—Fifty-six railroads filed a petition at St. Louis, September 30, in the Federal Circuit Court to enjoin the carrying out of the Interstate Commerce Commission's order lowering rates for live stock shipments from Texas points. The order was issued under the Hepburn act. The plaintiffs claim that the order would cause them a loss of $1,000,000 a year, and is confiscatory. They also allege that the order reducing switching charges from $1 to $2 a car on all Chicago lines from terminals to stock yards means $300,000 a year loss. A dispatch from San Francisco on the same day the above suit was filed says that the United States Circuit Court decided against the application of the Southern Pacific Railroad Company for an injunction against the Interstate Commerce Commission to prevent putting into effect a reduced rate on rough lumber shipments from San Francisco. The railroad had advanced its rates 10 per cent., and the Interstate Commerce Commission at once prohibited the increase.

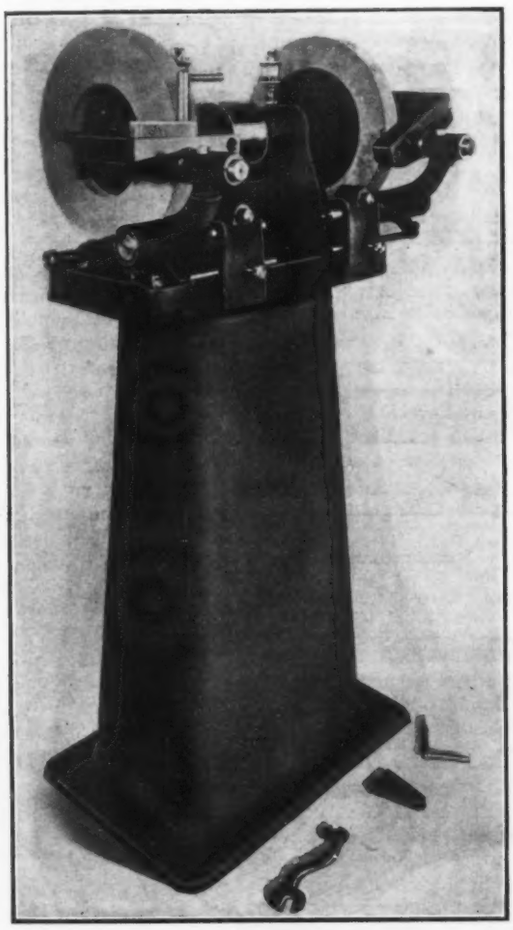
The sale of the foundry department of the Franklin Moore Company, Winsted, Conn., to the Sessions Foundry Company, Bristol, Conn., has caused the circulation of an erroneous report that the company had sold its entire business to the Sessions Foundry Company, and that the plant was to be moved to Bristol. The Franklin Moore Company simply sold its foundry department, which was a very small portion of its business, and this was done to allow the company to give more attention to its bolt and crane departments which it is enlarging.

The Emmert Face Grinder.

For grinding lathe and planer tools, edge grinding and squaring up ends of work and miscellaneous small grinding jobs the novel face grinding machine illustrated is especially adapted. It is a new product of the Emmert Mfg. Company, Waynesboro, Pa.

A straight edge or surface on tools and a straight face on the edges of work is more easily and accurately obtained by using the face of the wheel, if the face is straight and the wheel of suitable character. It is contended that such a face cannot be obtained nor the diameter of the wheel kept true with an ordinary emery wheel dresser. One of the features of this machine is the provision for using a diamond for truing up both the face and the periphery of the wheel.

A work table is located in front of and extending by the edge of the wheel, so that both the face and edge of



A New Face Grinding Machine Built by the Emmert Mfg. Company, Waynesboro, Pa.

the wheel can be used for grinding. This table is in a guide carried by a transversely swinging arm, and in the end of the arm a longitudinally adjustable diamond holder is located. Normally the table can be either clamped, to prevent any transverse rocking movement, or adjusted to allow a certain amount of such movement, which is often an advantage in grinding wide work. When the surface of a wheel becomes dull or untrue an adjustable stop below the table is moved out of its path and the table swung backward away from the wheel; then swinging the diamond across the face of the wheel gives the latter a good cutting and a straight surface. The diamond holder may be quickly transferred from one end of the machine to the other, and with a little care the diamond will last indefinitely.

The table is also slidable longitudinally of the machine in the guide, and is provided with a threaded hole to receive the diamond holder, which may be transferred to this hole and the edge of the wheel trued off by sliding the table in its guide. The table guide is pivoted in the diamond carrying arm and can be set with reference to graduations and clamped at any angle with the face of the wheel up to 45 degrees. Upon the table is also provided an adjustable squaring device or protractor, which may be set from 90 to 45 degrees with the surface of the wheel.

The wheel spindle of this machine is hardened and runs in adjustable bronze boxes. The wheels used are 12 in. in diameter by 1½ in. thick and are recessed. A water tank of ample capacity and located conveniently to the operator is provided for cooling work.

The World's Production of Coal.

E. W. Parker, the coal expert and chief statistician of the United States Geological Survey, estimates the world's production of coal for 1907 at 1,209,184,109 net tons, of which the United States furnished 39.7 per cent. The following table, showing the production of the principal coal-producing countries for the year nearest the one under review for which figures could be obtained, gives the details of his estimate:

The World's Production of Coal.

	Net tons.
United States (1907)	480,363,424
Great Britain (1907)	299,970,677
Germany (1907)	226,773,605
Austria-Hungary (1907)	43,955,315
France (1907)	40,708,215
Belgium (1907)	26,261,745
Russia and Finland (1906)	23,857,961
Japan (1906)	15,362,467
India (1906)	10,957,240
Canada (1907)	10,510,961
New South Wales (1906)	8,541,525
Spain (1906)	3,620,588
Transvaal (1907)	3,261,533
New Zealand (1906)	1,937,080
Natal (1905)	1,264,995
Mexico (1906)	846,416
Queensland (1907)	765,265
Holland (1906)	587,283
Italy (1906)	521,711
Sweden (1906)	327,361
Victoria (1906)	179,907
Cape Colony (1906)	142,877
Tasmania (1907)	65,958
Other countries	8,400,000
Total	1,209,184,109

It will be observed that in 1907 the United States produced 60 per cent. more coal than Great Britain, and over 100 per cent. more than Germany. Exclusive of Great Britain, the United States produced in 1907 more coal than all the other countries of the world combined. Since 1899 this country has held first place among the coal producers. It has so far outdistanced Great Britain that that country can no longer be considered a rival, although it is only nine years since it was supplanted by the United States as the greatest coal-producing country of the world. It may also be noted that more than 98 per cent. of the total world's production of coal is from countries north of the Equator, the countries south of that line producing less than 20,000,000 tons annually.

Expansion of Valves at High Temperatures.—The results of experiments to determine the expansion of valves and fittings in service involving high temperature are given by the *Valve World*. Three flanges were taken, one of cast iron, one of ferro steel, and one of steel. They were exposed to varying degrees of heat for a period of 130 hours, the temperature being less than 500 degrees for 18 hours, 500 to 700 degrees for 97 hours, 710 to 800 degrees for 12 hours, and over 800 degrees for 3 hours. The average for 130 hours was 583 degrees. The view previously put forth by the *Valve World* was that cast iron subjected to continued temperatures of approximately 500 to 600 degrees takes a permanent expansion and does not return to its original volume when cooled. The results of the above mentioned experiments are stated as follows: Cast steel flange—no change. Cast iron flange—outside diameter increased 19-1000 in., inside diameter increased 7-1000 in. Ferro-steel flange—outside diameter increased 33-1000 in., inside diameter increased 17-1000 in.

The Broderick Automatic Electroplating Machine.

The first serious and successful invasion into the plating field of automatic labor saving machinery is that of David F. Broderick, whose representatives are Thornton N. Motley & Co., of 50 Church street, New York. The apparatus was first installed at the works of the Russell & Erwin Mfg. Company and later at the plant of the Yale & Towne Mfg. Company at Stamford, Conn. The latter installation is shown in the accompanying photographs. The broad principles of the Broderick machine may be explained with reference to the elevations, Fig. 1, and plan, Fig. 2, reproduced from his patent of December 25, 1906.

The different plating, washing and other solutions are in a series of tanks forming a long loop, over which there is suspended a thoroughly braced frame which carries the dipping apparatus. This consists of two endless chain carriers, A B, Fig. 1, arranged horizontally one above the other. Each chain carrier passes around one driven sprocket wheel, C, Fig. 2, at one end of the machine, and an idler sprocket at the other end. They are secured to vertical shafts, E, Fig. 1. The two chain carriers support at regular intervals work holders *d*, Fig. 1, which are free to move up and down while traveling along in and over the series of plating and washing tanks. In a general way, the device for lifting these work carriers from one tank to the succeeding one, in order to clear the sides of the tank, is as follows: A roller, f, f, Fig. 1, attached to the work holder strikes the inclined plane or "cam" *a*, and is forced to rise upon it by the motion of the chain carrier. It then moves horizontally along the bar *b*, and drops back when required, guided by the face *c*, Fig. 1. In the photographs this part of the mechanism is obscured or entirely hidden, and the details may therefore be referred to more specifically in the drawing, Fig. 3, which shows the sprocket wheel *c* at the right. The chain carriers travel in two channeled guides *i* and *j*, shown in section at the lower part of Fig. 3. The endless chain consists of a series of links, whose connecting pins project beyond the edges of the links for the reception of rollers, which run against the inner faces of the guides and prevent undue lateral vibration of the carrier. Any vertical vibration is guarded against by rollers disposed between the opposing edges of the channeled guides of each pair. A number of the links of the endless chain are provided with pintles, which project laterally beyond the channeled guides for the reception of the grooved wheels, *l*, Fig. 3. In the upper part of the engraving a cross section indicates the construction of these links with the guide rollers and the grooved wheels. The latter guide the workholder, *d*, *g*, Fig. 3, which is also the means of conducting the electric current into the bath. The upper part of the workholder is provided with a brush, *m*, which is in contact with the conductor strip *n*, but instead of using the workholder proper as the conductor, a rod, *e*, is employed. The dipping mechanism has been referred to. The detail may be mentioned that the "cam" bars, *a* and *c*, may be adjusted, the cam track having the form shown in section at *h*. Usually the lifting cam *a* is placed at a greater slope than the dropping cam, *c*. The various baths are provided with anode plates, while the work constitutes the cathode. Provision is made for automatically making and breaking the electric contact at any desired point.

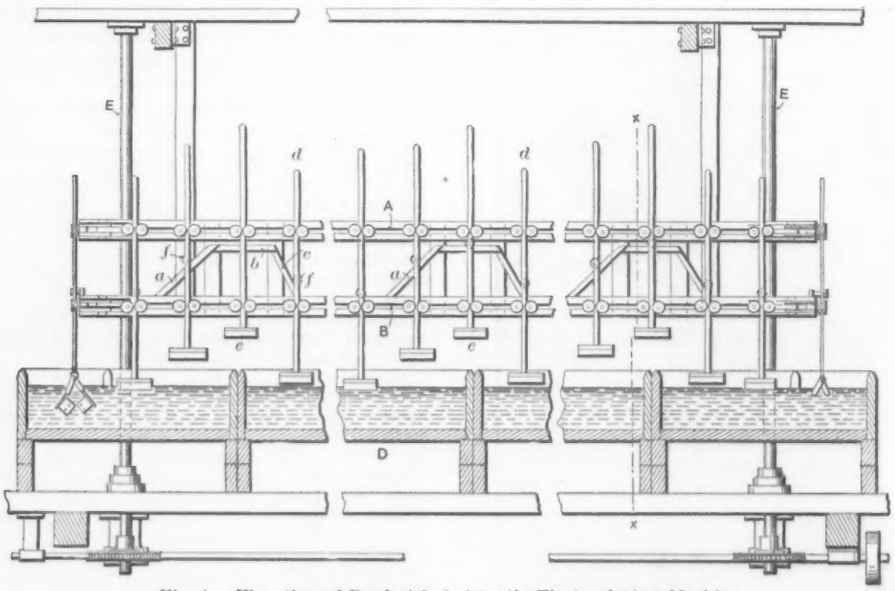


Fig. 1.—Elevation of Broderick Automatic Electroplating Machine.

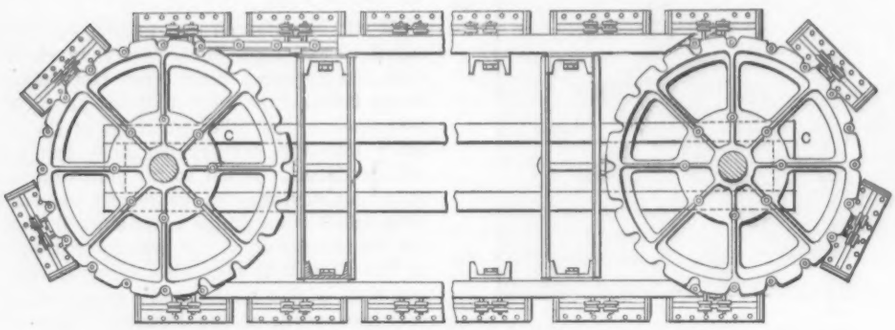


Fig. 2.—Plan of Broderick Automatic Electroplating Machine.

The machine may be adjusted, without stopping, for any desired number of operations within its capacity or for any length of article to be plated from 1 to 20 in. in length. The cams can be adjusted to provide for longer or shorter relative periods in the various baths as the nature of the work may require. Any desired bath may be slipped on a cheaper grade of work. Ball bearings are used to obviate the necessity of too frequent oiling, which might cause trouble by dripping into the solution.

The system is so designed as to incorporate into a single operation the following 10 minor operations, into which electro-plating and cleaning are usually subdivided:

1. Loading.
2. Washing in potash solution.
3. Washing in cold water.
4. Washable in cyanide or acid solution.
5. Washing in cold water.
6. Depositing in plating solution.
7. Washing in cold water.
8. Washing in hot soda.
9. Washing in hot water.
10. Unloading.

Three additional operations necessary in connection with oxidizing can be added if desired.

In executing the above operations in the ordinary manner, it is necessary to depend on the judgment of the operator for the relative length of time, and the condition in which the work should be after each operation. It often happens that he removes the hollow articles from one solution and plunges them into the succeeding bath in the cycle of operations before they are properly drained off, thus polluting the solutions and causing spots or other defects on the surface of the plated articles.

With an automatic apparatus for performing these operations the required ratio of time for each operation in the cycle necessary to complete the articles is not left to an unskilled operator, but is predetermined by the foreman or other competent person, and after the machine is once properly adjusted the work will pass through them automatically and return completed to the starting point under the same conditions, thus insuring uniformity both in quality and quantity of work, which could not be expected with the many chances for variation that exist in passing the work through the various minor operations by hand.

The apparatus requires two unskilled operators, one for loading the racks on the machine, and one for unloading and packing the articles in transporting boxes. A single operator could load and unload the machine if loaded racks were delivered to him within a convenient distance, and the work which he unloaded from the machine was dumped without sorting or packing at a point convenient to the machine. However, it is policy to have two boys operating the machine, and give them some other duties to perform, because if it is necessary for one operator to leave his work, the remaining operator could keep the machine loaded to its full capacity for an hour or two if necessary.

It is estimated that there is a saving from 80 to 90 per cent. in floor space for handling an equal amount of articles, with the usual series of tanks.

The amount of current theoretically should be the same with any system of plating properly installed. However, as a matter of fact with the improved arrangement of tanks, which concentrates and allows a better system of insulation than with a series of tanks scattered over a large department and which permits of getting better contact on the work on account of the agitation caused by moving it rapidly through the solution, it is found that a saving of about 20 per cent. is effected.

The actual labor cost per thousand with the machine running at its full capacity, would be about 5 cents a thousand (this would not include "stringing" small pieces on racks), but assuming that the machine cannot be kept running over 50 per cent. of the time, the maximum labor cost per thousand should not exceed 8 to 10 cents.

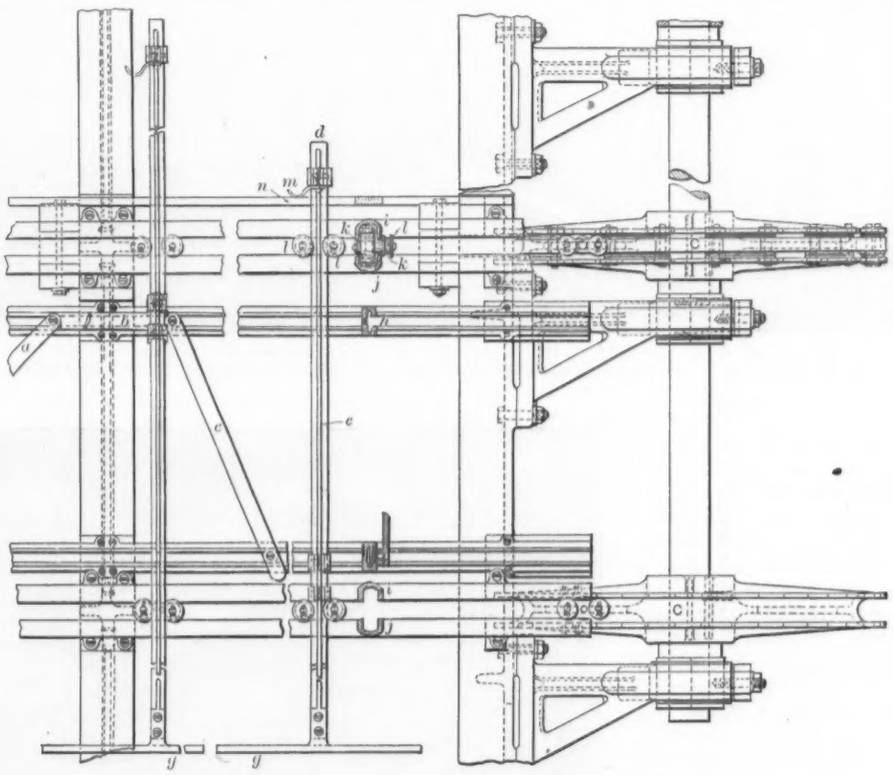


Fig. 3.—Elevation, Showing Workholder and Details of Chain Carrier.

A slight economy in material is effected, because the apparatus is so adjusted that it does not waste or pollute the solutions one with another, as is often the case with the usual method.

The system for plating includes the following groups of apparatus:

The 2000 ampere dynamo and a 2 hp. motor, with the necessary switchboard, instruments, wiring, &c. A variable speed countershaft must be provided, so that the speed of the chain carrier can be adjusted to the particular work in hand. If power is conveniently located for driving the machine and suitable current for plating is accessible, the dynamo and motor need not be purchased; however, it makes a more convenient and selfcontained system if they are used independent of the general system of the works.

As many storage tanks, with a capacity of about 2000 gal. are required, as there are different kinds of plating solution desired to be used on the system. The purpose of these storage tanks is to allow the use of the same system for many different kinds of plating, such as copper, brass, bronze, galvanized, &c. Changing from one

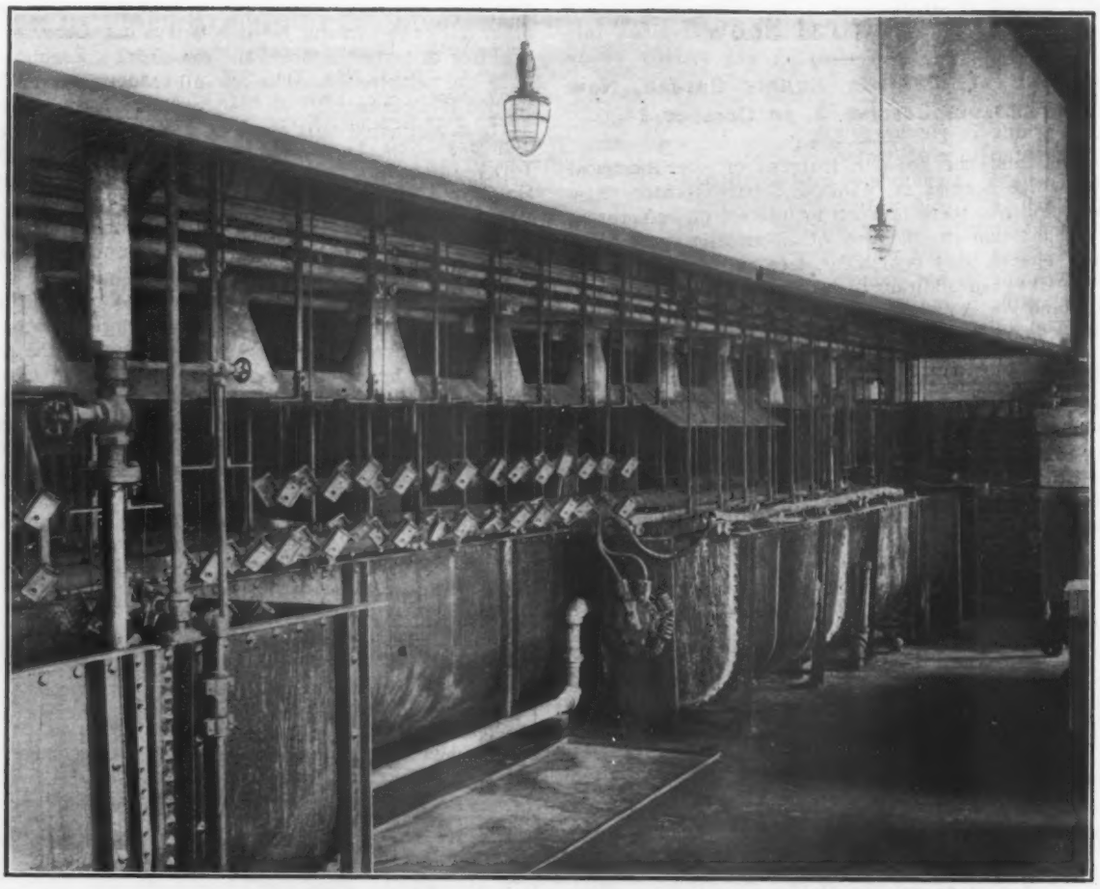


Fig. 4.—Side View of Broderick Electroplating Machine, Showing Loading and Unloading Station.

kind of plating solution to another requires about ½ hr.

The necessary washing and plating tanks are preferably made from sheet or boiler iron about ¼ in. in thickness, of U shaped cross section, unless it is desired to use acid solution, in which case the acid vats are preferably made of slabs of slate. In connection with these tanks there are the anode copper bars, anode hooks, the necessary piping for inlet and outlet of hot and cold water and drain pipes for other solutions, and coils of steam pipes for heating the solution and other desired hot baths.

An exhaust fan connected with the necessary hoods and galvanized iron piping is provided for exhausting the vapor and fumes from the various hot baths.

The capacity of the machine varies with the character of the work and the size of the articles to be plated. Small articles, like the parts of locks and of other articles included in builders' hardware, are plated at a rate as high as 100,000 pieces per day.

At the works of the Yale & Towne Mfg. Company the Broderick machine has been in successful operation for some time, performing the work which the exacting requirements of the high grade art hardware produced by that company call for.

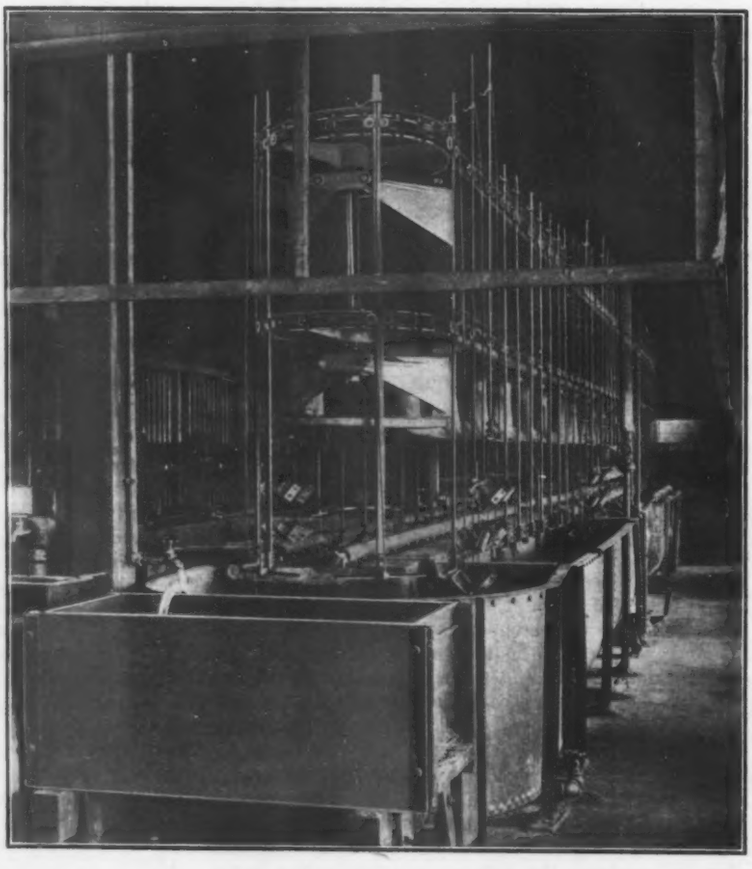


Fig. 5.—End View of Broderick Electroplating Machine.

The nine hundred thousandth patent from the United States Patent Office was issued October 3, and to it was attached the name of Patent Commissioner Moore. The patent was an improvement on traveling stairs, such as are used in hotels and other large buildings. Mr. Moore estimates that the one millionth patent will be reached in the year 1911. The total of patents issued by the United States is not very far below the total for all other countries for all time.

The Electrical Show.

Exhibition at Madison Square Garden, New York, from October 3, to October 14.

Aside from the popular features of the Electrical Show, which opened at Madison Square Garden, New York, October 3, there is much to interest manufacturers and mechanicians in the way of electrically driven machinery, electric shop equipment, factory lighting systems and the like. In addition to independent exhibits made by machinery and factory supply houses, the large power service companies' exhibits include demonstrations of electrically controlled machinery made by various manufacturers. Many of these exhibits were not in place the first few days of the show, but by the time this appears in print the show, it was stated, will be complete.

One of the most interesting exhibits to machinery men is that of the Watson-Stillman Company, New York, whose booth is in charge of George L. Gillen and Edward Johnson of the company's sales department. The company is showing a hydraulic press in operation stamping out metals to be used as watch fobs bearing the company's imprint, which are given out as souvenirs. It is a 120-ton machine driven by a belt from electric motors. The company is exhibiting hydraulic jacks, shaft straighteners, a small punch and shear and four small twinvolute turbine pumps. The latter exhibit is in charge of Harry Prindle of the company's pump sales department.

A New Resistance Wire.

Another interesting feature of the show is the exhibit of the Driver-Harris Wire Company, Harrison, N. J., supervised by Arlington Bensal, sales manager for the company. A new resistance wire, called Nichrome wire, is the principal feature of this company's exhibit. The company claims that it is the most perfect resistance wire ever invented for practical use. It is claimed that it has 60 times the resistance of copper and can stand an intense heat without becoming brittle or oxidized. It can be worked above red heat up to 1500 F. without its being harmfully affected, and a recording pyrometer is used to demonstrate the resistance power of the wire. The company is showing samples of a full line of its wire products from the coarsest resistance wire down to strands finer than silk.

A prominent place in the show is occupied by the engineering department of the National Electric Lamp Association, representing a number of electric lamp companies and showing their various products. The Grant flaming arc light, manufactured by the German-American Electric Company, 110 West Fourteenth street, New York, has an independent booth and is paying special attention to demonstrating the adaptability of the lamp for industrial installations. The industrial division of the Brooklyn Edison Electric Illuminating Company's exhibit contains a 25-hp. gas engine, a 25-hp. steam engine and an electric motor of the same power to demonstrate the comparative space taken up by the machines and to illustrate the difference in cost and advantages the company claims through the use of electric power. An interesting exhibit is that of the Consolidated Telegraph & Electric Subway Company, which includes a sectional reproduction of an underground manhole showing the various conduits and cables. The company is also showing a portable electrically driven air compressor used for rock drilling. Included in the exhibit of the United Electric Light & Power Company is a display of General Electric motors adapted for use in small industrial plants. The Otis Elevator Company is showing electric elevators. The Marvelous water heater, which is operated by electricity, is a feature of the exhibit of the Eastern Sales Company, New York, and the Goulds Mfg. Company, New York, is showing electrically driven pumps.

Other Exhibitors.

Other exhibitors are: Auto Igniter Company, New York; Campbell Electric Company, Lynn, Mass.; Edward C. Cary Company, New York; Electric Home Supply Company, New York; Electric Motor & Equipment Company, Newark, N. J.; Electrical Testing Laboratories, New York; Enos Company, New York; Excello Arc Lamp Company, New York; F. Alexander Electric Company, New York; Federal Sign System (Electric), New York; Fox Brothers & Co., New York; General Electric Company, New York; Habishaw Wire Company, New York; International Text-Book Company, New York; Manhattan Electrical Supply Company, New York; Marconi Wireless Telegraph Company, New York; Mead Company, New York; Murphy Rectifier Company, Rochester, N. Y.; National Vacuum Company, New York; Numaticon Company, New York; Nugget Polish Company, New York; Roger Williams, New York; Spencer Turbine Cleaner Company, New York; Stanley & Patterson, New York; New York Edison Company, New York; Simes Company, New York.

The show will continue until October 14, and in the hall adjoining the Auditorium a series of lectures devoted to the principles and applications of electricity will be given. Professor Sydney W. Ashe will talk on "Electric Light, Electric Railway and Transportation and Electric Measurements." Max Lowenthal will give a series of lectures on "Hydro Electric Power Generation, Transmission and Utilization" and "Electric Light, Heat and Power in Home and Factory." Frederick A. Collins will speak on "Wireless Telegraphy and Wireless Telephoning." The dates of these lectures will be announced during the show. A number of objects of electrical interest have been loaned by the Metropolitan Museum of Art, including exhibits connected with the first attempts made to lay a telegraph cable across the Atlantic Ocean.

The Keystone Steel Casting Company.—The new plant of the Keystone Steel Casting Company, at Avonmore, Pa., on the West Penn Railroad, about 15 miles from Pittsburgh, which has been under construction for about a year is practically completed. The company owns a tract of 6 acres adjoining the plant of the West Penn Foundry Company, on which the new works have been built. The main building is 110 x 210 ft., and is equipped with a 7-ton cupola, a 3-ton Bessemer converter, a 5-ton open hearth furnace, electric cranes and other necessary machinery. Power for the electric plant is supplied by a 100-hp. engine and boiler. The blowers are operated by a 90-hp. gas engine and the converter by electricity. Power for the pattern shop is supplied by a 25-hp. gas engine. The pattern shop is a separate building, 50 x 65 ft., and the office and laboratory are located in a third building. John Sauers is president of the company and Alfred Tompkins is secretary.

The Institute of Metals.—The Interim Council of the Institute of Metals has appointed as permanent secretary G. Shaw Scott, who has a large scientific and practical knowledge of metals. The first general meeting of the institute will be held in Birmingham, November 11. A local committee, consisting of Prof. T. Turner, Mr. Boeddicker, and others, is making arrangements. Papers or communications are expected from a number of persons, including Dr. Glazebrooke, Mr. Rosenhain, A. M. M. Philip, Admiralty chemist; Dr. Hodgkinson, and Mr. Robertson. The permanent office of the institute will be in London, probably in the vicinity of the Institution of Mechanical Engineers. A subcommittee has this matter in hand, and it is expected that by the end of November the London office will be opened.

Prominence has been given in the daily press to a report in which it was said that the Wisconsin Steel Company, Chicago, a subsidiary interest of the International Harvester Company, has broken ground at its works on Torrence avenue for a new wire drawing plant to cost $1,000,000. This report is officially declared to be without foundation, and furthermore that the company is not planning to engage in the manufacture of wire. The report probably had its origin in the fact that foundations are now being laid for a building to accommodate a drawn shafting department, which will supply material for consumption in the company's own factories.

THE IRON AGE

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A Twenty-Five Year Record in British and American Iron Centers.

The Iron and Steel Institute revisited the famous Cleveland District in England last week, this year being the twenty-fifth since its last meeting at Middlesbrough. A review of the district's progress in iron and steel in a quarter century was presented in a paper by W. Hawdon. While it shows a real advance, it is like all the statistical exhibits of the British iron trade in the past two decades or more, in having none of the sensational contrasts that make American iron trade statistics really fascinating. As the leader in pig iron and open hearth steel production in Great Britain, the Cleveland District may be compared with the Pittsburgh District in the United States, by way of bringing out the contrast between the pace at which the iron industry has advanced in this country and the rate of development which may be taken as the British standard. As the paper before us goes back to 1883, the comparison with the Pittsburgh District is particularly opportune, since that was the year in which Allegheny County passed the Lehigh Valley and took the lead in pig iron production in the United States. In the statement below we show the production of pig iron and steel in the two districts at the beginning and end of the twenty-five-year period in gross tons:

	1883.		1907.	
	Pig iron.	Steel.	Pig iron.	Steel.
Cleveland Dist. (Eng.)...	2,760,740	314,606	3,534,068	1,749,347
Pittsburgh District.....	528,995	362,080	5,438,233	6,905,590

Expressing the growth of production in the two districts in percentages, the contrast is presented of an increase in pig iron output in the Cleveland District of 28 per cent. in the 25 years, while in the Pittsburgh District the increase in the same period was 928 per cent. The showing in steel is naturally more striking, since it represents not only the growth of an important period in the world's industrial development, but the revolution due to the converter and the regenerative furnace. As against 456 per cent. increase in steel for the Cleveland District there is a gain of 1808 per cent. for the Pittsburgh District.

Leaving these contrasts in growth, which are first suggested by Mr. Hawdon's paper, some of its statements concerning the Cleveland district are worthy of attention. The Cleveland iron ore production of 1883, it is a surprise to note, was the greatest on record—6,756,055 tons. In 1893, when steel had begun to replace manufactured iron, and foreign ores were being imported by the district for the production of acid steel, the demand for Cleveland pig iron for puddling fell off, and the lowest point in Cleveland iron ore production in the past 30 years was touched, at 4,625,530 tons. The development of basic open hearth steel manufacture in the Cleveland district, as shown by a production of 139,784 tons in 1903 and 416,207 tons in 1907, turned the tide in favor of native ores, and last year the ore production was 6,220,000 tons, or still 500,000 tons less than in 1883. Two causes have operated to prevent the Cleveland iron and steel companies from getting a sufficient supply of native ores. One is the gradual thinning of the ore seams and the necessity of carefully extracting shale and sulphur. The other is the action of the miners, who, when trade is good and wages high, cut down their daily output. It is worth while to note what the writer of the paper says on this point, as it is typical of British trade union procedure, and has its bearing on the tameness of the quarter century's statistical showing:

> One is bound to ask, Why not put more men on? The reply in part to this is that the miner, when being taught his trade, cannot "get" so much stone, and therefore of course cannot earn what is known as the average of the district, and when this happens a pretext is apt to be made by the miners' officials for an increase in the price per ton for getting the stone. The manager is thus between the devil and the deep sea; he wants more stone, but he cannot get it without paying a price which he cannot afford to give, and therefore hesitates to put on labor which has yet to be taught to be efficient. This is a curious incident when taken in connection with the unemployed problem, and apparently helps to maintain the army of unemployed, whereas the demand for more miners ought to afford an opening for their employment. Whatever the cause, the fact remains that, with the present demand, we are supplementing our supplies by using more foreign ores, and ores from other districts, for mixture with Cleveland ore, to keep pace with the demand. This of necessity increases the cost of production of Cleveland pig iron.

It is hard to imagine what would have been the state of Lake Superior iron mining to-day, or of the American steel industry at large, had its development been contingent upon the consent of such a type of labor unionism.

In reference to the power economies which are assuming prominence in all iron and steel operations, the paper notes that gas utilization is coming on slowly. In but few cases are blast furnaces and steel works found in conjunction, and fuel is so cheap that the saving in coal would not compensate for the installation of gas engines and gas cleaning plant. It is interesting to find, however, that in the way referred to in a paper printed elsewhere in this issue, a public electric power company is buying the exhaust steam from the Cleveland blast furnace blowing engines, and utilizing it in low pressure turbines to develop electric power of high tension. This method of making use of waste steam, and also of gases from blast furnaces, promises to develop into large proportions in this historic iron making center of Great Britain.

Engineers' Power Tests of Machine Tools.

A few tool builders are making scientifically accurate measurements of the power consumed in driving their machines. The knowledge thus obtained has proved so valuable in correcting the estimates of designers and in providing data for the future development of their lines that a general adoption of the practice appears highly desirable. When the capacities of machine tools were limited by the use of carbon tool steels the question of power was not of such great importance. The machine was strong enough to stand up under any strain the cutting tool could endure, so that the limits were well defined and understood. But with the introduction of high-speed steels and the resultant redesigning of machinery to utilize their advantage fully, power has become an element of design requiring most careful attention.

The better realization of the matter has led to the

adoption of exact methods of determining this factor as it may exist under any condition of machine practice or experiment. A machine may be overpowered or underpowered; it may be given work to do that will impose excessive strains and consequent undue wear, or it may not be driven to its real capacity. Not only have the builders begun to employ scientific methods of determining these and similar facts, but some of their customers are doing likewise, insisting that their own engineers make the necessary tests on each machine or representative of each group of machines installed in their works. The manufacturers of electric equipment have gone into this more than any other industrial class, but the practice is not confined to them. A typical example is one of the great American steel companies which has found the tests well worth while, and has several times corrected to its own advantage errors in power estimates made by the machinery builders, the motor specified being either too large or too small for its purpose. The idea has also been successfully applied abroad, a notable exponent of the application of engineering science to this work being one of the most progressive of the British machine tool manufacturers, who has established the American system throughout his plant.

It is not always an easy matter to calculate the exact horsepower required to operate a machine tool, especially if heavy duty is to be imposed upon it. The most expert and painstaking designers have found themselves seriously at fault, when an engineer's test of the tool has been made. A specified 20-hp. motor has proved too powerful for economical service. A 10-hp. motor turned out to be wholly insufficent to bring out the real usefulness of a machine. In another case, the test revealed the fact that altogether too much power was consumed in the machine itself between the driving shaft and the point of the cutting tool. Quite frequently the testing apparatus brings to light similar hitherto unsuspected discrepancies between estimate and reality. Of course in many cases, perhaps in the large majority of them, the estimate is near enough, but there can never be any certainty that such is the case, and exact knowledge is of the highest value in machine design.

There is a natural inclination to overpower a machine tool, which is to be used with high speed steels. Every machine has its limit of economical operation; to force it beyond that point may mean much greater production for the time being, but it also means proportionately excessive rapidity of deterioration. This tendency in design may extend to making machines too heavy and more powerful than any cutting steel can stand up to, which former fault may have its compensations in rigidity and durability unless carried to the extreme of excessive cost. In other cases the power required to run the machine itself apart from its work is too great, inviting redesigning when the facts become known.

The machine designer strives to give to the machine the correct relation of strength and power and cost; for heaviest duty the maximum capacity of the high speed steels is the basis upon which the design is founded. It is easy to see where the initial machine of a new model would be a source of enormous practical advantage to the designer if he could equip it for exact measurements of power. There would be revealed to him the power required for each combination of speed and feed, and that for running idle; the effect of excessive strains upon the machine members, perhaps exposing weaknesses which otherwise might not appear until the machine was in operation in the customer's works, and the means of determining economical running points.

Underpowering a machine is more often the error of the customer than of the builder. One is constantly hearing of cases where investigation of the complaint of inefficiency in a tool has demonstrated the utter failure to carry out the manufacturer's specifications as to size of motor, or speed or width of belt. But occasionally the machine builder is himself at fault in this respect, underestimating the power required to do the best work with the tool, an error which the engineer's test would have quickly brought out before the machine was shipped from the shop.

The equipment with which to obtain this knowledge of power is not an expensive one for a large establishment, nor need it be for a small one, if electric power is available, as it is in almost every shop to-day, for the electric motor method of measurement is easily applied for the purpose. The belt method is sufficiently exact in many cases. Various instruments for assisting in the work are available. If the owner of a shop does not care to equip it, engineers may be found almost everywhere who would make tests.

To Help the Railroads.

The formation last week of an organization by manufacturers of railroad supplies and equipment, with the purpose of combating public criticism and action adverse to the railroads of the United States, is an important movement. Railroad buying has shrunk to an alarming extent. The enlistment of so many important interests in a campaign of education, as shown by the names appearing in another part of this issue, denotes that the situation is a serious one. Those who participated in launching the organization should certainly be in a position to judge the harassing conditions which prevail, and their statement that the carrying interests are suffering more than their share of the business depression because of public clamor against them, is worthy of serious consideration. When railroads are not in a position to make extensions and repairs to their systems the public in general suffers, primarily because of inadequate railroad service, but principally because the lack of orders for material affects nearly every important branch of manufacture.

While the action of those represented at the meeting was not entirely unselfish, the spirit of extending help to interests thought to be unfairly treated by contributing time and money to such a movement should receive consideration from those who are opposing railroad interests and cause them to weigh their actions carefully. The efforts of the organization to secure fair play for the railroads are worthy of help, and as long as legitimate means are adopted to promote favorable public opinion and obtain fair legislation for railroad interests, the industrial world in general would do well to give the movement its assistance.

The business of the Heany Fire Proof Wire Company and that of the Teter-Heany Development Company, York, Pa., have been absorbed by two new companies which are largely controlled by New York interests, and which are capitalized at $3,500,000. The new companies will continue to operate the plants at York, which they are now enlarging. The plant of the Heany Fire Proof Wire Company, manufacturer of asbestos covered wire, is to be operated by the Heany Company, and the other branch of the business, the manufacture of tungsten lamps is to be conducted by the Heany Lamp Company. These companies have opened offices at 25 Broad street, New York. The officers and directors are N. Horheimer, president; Alvin Young, vice-president; R. H. Shindel, second vice-president; Richard Irvin, secretary; Curtis Hathaway, Gordon Brown, W. F. Bay, D. F. Lafean and R. A. Brodbeck.

The Mining Engineers.

The Meeting at Chattanooga.

What was in many respects the most successful meeting of the American Institute of Mining Engineers in recent years was held at Chattanooga, Tenn., during the past week, a considerable number of those in attendance leaving for Ducktown, Tenn., on Tuesday, the 6th. The original plan had been to hold the fall meeting at Birmingham, Ala., but the labor troubles in the district last month made it advisable to postpone the visit until a more auspicious occasion, since a settlement of the difficulties might have been delayed. This led to the acceptance of an invitation to Chattanooga, at rather short notice to the members of that city. In spite of what might have been a disadvantage, the members at Chattanooga and their friends arranged for a splendid programme of entertainments and excursions, while the list of professional papers available for presentation and discussion at the sessions was unusually large, varied and valuable.

The opening session, under the presidency of John Hays Hammond, was a brief one, the train bringing the majority of the members coming from the North having been delayed considerably. The Institute was welcomed in this, its third visit to Chattanooga, by Captain H. S. Chamberlain, the chairman of the local committee, and well known throughout the country as one of the pioneers in the development of the Chattanooga district as president of the Roane Iron Company at Rockwood, Tenn., and of the Citico Furnace Company of Chattanooga, Tenn.

The president, John Hays Hammond, then presented his annual address, entitled

Professional Ethics.

in which he dwelt on the wider responsibilities of the mining engineer, as they relate to the determination of the pecuniary relations of the proposition under consideration. He analyzed the relation of the engineer to his employers, and stated as the experts' golden rule: "Tell unto others now whatsoever you would not have them tell on you (with unjust misunderstanding and scandalous comment) hereafter!"

Mr. Hammond then dealt in the following manner with a subject which is often spoken of but rarely discussed publicly by engineers.

Another question involved in the relations of a mining engineer to his employer concerns the acceptance of commissions from the sellers of machinery, supplies, &c., the purchase of which he has made as agent, or recommended as adviser. In many instances of similar nature affecting other professions, this practice seems to be established and condoned, if not avowedly justified. It is even defended by ingenious sophistry, somewhat as follows: The manufacturers of certain articles are bound by trade agreements not to sell them below a certain price, or, in the absence of such agreements, do not dare to "cut" the price, for fear of thereby invoking savage reprisals from their competitors. But this minimum price includes the salary or commission paid to a regular selling agent. If, therefore, the agent of a customer makes a purchase direct, without the intervention of their sales agent, they are willing to pay him "the regular commission," though they are not willing to reduce by the same amount their bill to his employer. The argument is plausible from the manufacturer's standpoint; and indeed it is hard to judge him justly. For if, in a given case, in order to gain a customer he undersells his competitors, he may be committing the henious modern sin of granting a "rebate"; whereas, if he refuses to do this, he may be guilty of partnership in a wicked "trust" or "combine." The popular sentiment and legislative furore which condemns at the same time free competition in prices and every agreement to prevent such competition, needs, as President Roosevelt has, in substance, frankly declared, to be modified by common sense.

But we are not now concerned with the ethical or legal problems of the manufacturer. From the standpoint of the engineer, acting as a purchasing agent or adviser, the case seems to me as clear in the court of honor as it would be in a court of law. He cannot honorably accept a commission from the seller, while he is the agent of the buyer. If the custom of the trade permits the giving of such a commission, but not its deduction from the face of the bill rendered, he may, of course, honorably accept it and pay it over to his own employer—that being the only way in which he could secure the minimum net price in his employer's interest. But even in that event he should place his honor beyond suspicion—as, for instance, by demanding the commission in a check to his own order, and indorsing the same check to the order of his employer. There may be exceptional cases in which the taking and keeping of a commission is justifiable, but one thing is clear beyond dispute: it is always wrong when it needs to be kept silent.

Mr. Hammond spoke of the position of the engineer as an expert witness in a court of law and of his responsibilities toward the public as the indorser of a proposed undertaking.

Dr. R. W. Raymond, in closing the session referred to the careers of two of the old members of the Institute which it has recently lost by death, Capt. John Wilkes of Charlotte, N. C., and James D. Hague of New York.

The session on Friday morning was opened with the reading of a paper by T. H. Aldrich, Jr., of Birmingham, Ala., on the "Treatment of the Gold Ores of Hog Mountain, Ala.," the most interesting feature of which was the account of the studies made chemically and with a microscope of the exact manner in which the gold is carried in the ore and how it is locked up.

Then followed the paper, by Edward Bailey Cook, of Pottstown, on

The Gayley Dry Blast

which was printed in the last issue of *The Iron Age*. The discussion was opened by Edgar S. Cook, president of the Warwick Iron & Steel Company, who desired to put on record the fact that it is not true, as occasionally intimated, that the company was given the right to use the Gayley process free, in consideration of introducing it into the plant. The Warwick Iron & Steel Company paid license, and is not in any way interested in exploiting the process. One clause in the contract with Mr. Gayley is that access be given to the data gathered. Mr. Cook explained his early interest in the use of dry air. As early as 1889 he began to gather data systematically on the moisture in the atmosphere as one of the factors influencing the changes in furnace working, and by watching the moisture he succeeded in keeping the furnace steadier and in lowering the fuel consumption. Mr. Cook referred to the fact that the elimination of the moisture in the blast was even then an old idea, and he had consulted with John Birkinbine of Philadelphia about means of accomplishing the end in question. The conclusion was reached that the cost would be as much as the possible gain. He did not at that time, nor had others realized what an influence upon uniformity of results the drying of the blast would have. Mr. Cook called attention to the fact that when there are 4 grains of moisture in the air there are being pumped into the furnace 150 lbs. of water per ton of iron produced, as illustrating the magnitude of the evil.

J. E. Johnson of Glen Wilton, Va., noted that Mr. Cook's records show some difference between summer and winter work, while C. A. Meissner, in former discussions, claimed that the effect was alike in both seasons. Mr. Johnson criticised the refrigerating plant on the ground that the work could be very much more economically performed. Thus far, it has been done in the simplest manner which may be justified during the experimental period. The question having been raised as to the effect of moisture in the stock in different seasons of the year, Mr. Johnson explained that that made no difference, since the moisture is removed by the waste heat in the throat. It does, however, cut down the heat in the gases and affects their combustion in the stoves.

John B. Miles of Frank C. Roberts & Co., Philadelphia, agreed with Mr. Johnson in his position that the cost of lowering the moisture in the blast by refrigeration can be considerably reduced by adopting direct refrigeration by ammonia, and not indirectly by brine. He had made an estimate, providing for a liberal charge for interest and depreciation, which showed that such a plant would more than pay for itself in two and a half years.

Mr. Johnson referred to the advantages of refrigeration in stages, and the lower cost thereof.

Dr. R. W. Raymond spoke on Mr. Gayley's invention, and explained the circumstances of Mr. Gayley's application in England for a renewal of his first patent

which has recently expired, for a period of seven years in addition to the original grant of 14 years. Mr. Gayley worked out his invention for a number of years, and then had considerable difficulty in inducing the management of his company to adopt it. It was finally put into operation at the Isabella furnaces at a considerable personal sacrifice by Mr. Gayley, and it is reported in the absence abroad of Charles M. Schwab. It took further time to introduce it into England, these facts being recited to establish Mr. Gayley's failure to benefit from the patent, in spite of diligence.

Particular interest attached to Mr. Gayley's application for an extension of his patent, because it was the first of its character under the new English practice. Formerly such applications came before the Privy Council; now it comes before a single judge, whose first case it was. In the course of the proceedings the judge soon waived aside any additional testimony on the value of the patent, which he was emphatic in stating had been fully established, but he did not appear to be satisfied as to the lack of remuneration to the petitioner, and took the broad ground that it was against public policy to force Englishmen to pay for the use of an invention by granting an extension, when Belgians could use it free of cost.

Dr. Raymond stated that the Gayley invention had gone through four stages, the first, in which the belief was prevalent that it had not been done; the second, that it had been acknowledged that it had been done; the third, the admission that the figures might be correct, although in conflict with theory, and the fourth, that the invention was not new, anyhow. Dr. Raymond called attention to the fact that it was a very difficult proposition to take the moisture out of what might be called a hurricane, the air flowing through the tuyeres at a speed of 25,000 feet per minute. Cooling down to 40 degrees does no good, but does harm. The blast must be cooled to zero, centigrade, and lower, or otherwise the moisture will not be deposited, but merely form a fog which is carried into the furnace.

The session closed with the reading of a very suggestive and valuable paper by John B. Miles of Philadelphia, on the "Relation of Slow Driving to Fuel Economy in Iron Blast Furnace Practice." Unfortunately, the hour was so far advanced that a discussion of this paper, which we print elsewhere, was impossible.

Before noon the members started in automobiles provided by members of the local committee to visit Chickamauga Park, where at Wilder's Monument, Hon. Henry Clay Evans outlined the principal movements of both armies during the battle. After lunch at Camp Oglethorpe a complimentary review and drill was held by the Twelfth United States Cavalry. The party returned to Chattanooga along the crest of Missionary Ridge.

The session of Friday evening was given to economic geology, the papers presented being that of Charles Butts of Washington on the "Geology of the Alabama Coal Measures," and by Ernest F. Burchard of Washington on the "Clinton Iron Ores in the Birmingham District."

"Monazite in the Carolinas" was the title of the first paper read at the Saturday morning session by Joseph Hyde Pratt of Chapel Hill, N. C., and Douglas B. Sterrett of Washington. It was followed by the paper by J. J. Rutledge of Baltimore, Md., on the "Clinton Iron Ore Deposits of Stone Valley, Huntington County, Pa.," in which the genesis of the Clinton ores was discussed. H. Foster Bain, director of the Geological Survey of Illinois, in a few sentences, admirably summarized the problems involved in the utilization of the coals of Illinois. The paper, entitled "Studies of Illinois Coals," is a symposium prepared by Professor Bain, Frank W. De Wolf, J. M. Lindgren, Perry Baker, George S. Rice, J. M. Snodgrass, A. Bement, W. F. Wheeler and C. K. Francis. Covering over 70 pages, it is probably the most illuminating summary of the conditions affecting the occurrence, mining and utilization of the coals of a State, with a clear statement of market factors which has yet been given to the literature of our fuels.

The afternoon was spent in a visit by special train to the lock and dam and power plant now under construction at Hale's Bar, on the Tennessee River. During the morning session Major Harts, United States Engineers, had outlined the plans of this great work, which is to develop 30,000 hp., and at the same time is to improve the navigation of the river.

In the evening there was a banquet tendered to the institute by an organization of public spirited citizens, the Chattanoogans, whose last guest was Ambassador Bryce.

On Monday morning the party were conveyed by special train to Rockwood, Tenn., for a visit to the mines and furnaces of the Roane Iron Company, under the guidance of F. H. Clymer, the general manager, as chairman of the local committee.

On Tuesday evening the party left for Copper Hill, Tenn., to visit the copper mines and works of the Ducktown district, where the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Company are operating. Special interest attached to the new sulphuric acid works of the former.

The Relation of Slow Driving to Fuel Economy in Iron Blast Furnace Practice.*

BY JOHN B. MILES, PHILADELPHIA, PA.

The present period of depression in the iron industry, with the resultant close approximation of the cost of production to the selling price of pig iron, should make the discussion of this subject at this time not only interesting, but profitable. It is possible that it may result in the collection of data, which, when added to those set forth in this paper, will clearly indicate the influence of the rate of driving a blast furnace upon its fuel economy.

The question is not whether an excessive rate of driving (meaning a rate definitely in excess of the average rate in the United States) results in an increase in the fuel consumption, but rather whether a rate considerably less than the average does not result in a marked decrease in the fuel consumption.

The commercial and metallurgical sides of this problem must be kept separate. With a large margin between the cost of production and the selling price of pig iron, and a plant already in operation, it is frequently profitable to sacrifice a couple of hundred pounds of fuel per ton of pig iron in order to secure the greater gross profits resulting from a larger tonnage. When this margin decreases with a plant in operation, or when the determination of the size of a new furnace intended for a certain production confronts the management, a clear understanding of the effect of the rate of driving upon fuel economy becomes necessary.

If it be granted that slow driving leads to low fuel consumption, it should be borne in mind in the design of a new plant for the production of a certain tonnage that the adoption of an economical rate of driving increases only the size of the furnace proper, whereas, due to the decrease in quantity of blast required on account of the decrease in fuel burned, the stoves, the blowing engines, the boilers and the piping may be decreased in capacity. The pressure of blast is decreased, which affects the boilers and blowing engines and increases the surplus power if gas engines are installed with the hope that a source of revenue will be found in the sale of power or its use in a nearby steel plant.

It is hardly necessary to call attention to the commercial value of a decrease in the loss from flue dirt as well as to a decrease in the difficulties due to its presence in the gas, with its adverse effect on stoves and boilers.

The rate of driving may be expressed in various ways, but for ease of calculation I have used, as an index, the consumption of fuel per square foot of hearth area per minute; thus paralleling the rate of driving of a boiler as expressed by the burning of so many pounds of coal per square foot of grate area. This naturally suggests the analogy between the relation of hearth area to cubic capacity of the blast furnace and the relation of grate area to heating surface in a boiler.

* Read at the Chattanooga meeting of the American Institute of Mining Engineers, October, 1908.

It would be still simpler to use as an index the piston displacement of the blowing engines per square foot of hearth area, but this introduces the efficiency of the blowing tub, and the tightness of valves and piping, all of which are outside of the furnace, and renders this method of comparison absolutely unreliable, no matter how convenient it may be for use in directing the furnace operation from day to day. Instead of the pounds of fuel, it would be still more accurate to use the weight of carbon burned per square foot of hearth area, but the analysis of the coke is not always obtainable, and furthermore, this refinement is not thought necessary.

The measure of economy in fuel consumption is best expressed by the total burden of ore plus limestone carried per pound of fuel. In all comparisons, the silicon content of the iron, the character of the ores used, and the quality of the fuel must be considered. No attempt has been made to reduce these total burdens in the accompanying table to a common basis whereby these factors would be introduced mathematically, and the comparative excellence of the furnace practice in the various cases be finally set forth. It will therefore be necessary in comparing a high silicon record with a low silicon one, to make allowance for the difference in burden which ordinarily obtains in making pig iron of different silicon content.

It is not supposed that even the best of the records given in the table indicate the ultimate limit of burden carrying capacity, and it is hoped that others may be given by members which will show even better work. No doubt some records may be produced showing excellent work with rapid driving, and doubt may result that the generalization connecting slow driving with fuel economy has been proved. Nevertheless, it must be admitted that many of these records show remarkably good work of furnaces taking a quantity of air in comparison with the size of the furnace much less than many furnace managers would consider feasible. In order that this effect may be more clearly seen, the quantity of air per minute has been calculated from the coke burned per minute, and has been introduced in the table under item *q*, on a constant nominal basis of 60 cu. ft. of air per pound of fuel.

Records Nos. 1 and 2 are German furnaces using minette ore. The total burdens, given under item *o*, are remarkably high, while rates of driving, indicated by the fuel burned per square foot of hearth per minute, and given under item *p*, are the lowest in this collection of records.

Record No. 3 is of a furnace in the Middlesbrough District, England. The ordinary rate of driving in this district is about 2.5 lb. of fuel per square foot of hearth area per minute, and the fuel economy is excellent.

Record No. 4 is of Union furnace No. 1 of the Illinois Steel Company.* Although the total burden carried is not among the highest, yet remarkably low fuel consumption was obtained on account of the richness of the ore. A comparison with the ores in use to-day is interesting.

Record No. 5 is of the furnace of the Penn Iron & Coal Company, taken from Arnold K. Reese's paper.†

Record No. 6 is of a charcoal furnace.

Records Nos. 7 and 8 are of two furnaces with identical lines using Cornwall ore. These data are interesting because the difference in fuel consumption shown obtained over long periods consistently, the difference in the rate of driving being also constant, due to a difference in the blast equipment.

Records Nos. 9 and 10 are of a furnace in Illinois. These show the effect of an increased rate of driving, the blowing equipment having been enlarged during the month of November.

Record No. 11 is of a furnace, the hearth diameter of which was made large in relation to the desired output when the furnace was designed, with the hope that the resulting slow driving would give a low fuel consumption. The performance of this furnace from the begin-

Data of Blast Furnace Records.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
a. Date	1904.	1904.	Oct., 1905.	Aug., 1890.	1895-1898.	1898.	March, 1899.	March, 1899.	Oct., 1906.	Dec., 1906.	March, 1908.
b. Period	Year.	Year.	28 days.	14 days.	181 days.	Year.	7 days.	7 days.	Month.	Month.	7 days.
c. Hearth diameter	14 ft. 5 in.	11 ft. 6 in.	11 ft. 0 in.	8 ft. 6 in.	10 ft. 6 in.	7 ft. 0 in.	10 ft. 0 in.	10 ft. 0 in.	15 ft. 6 in.	15 ft. 6 in.	13 ft. 6 in.
d. Bosh diameter	22 ft. 2 in.	22 ft. 2 in.	20 ft. 2 in.	14 ft. 10 in.	16 ft. 6 in.	12 ft. 0 in.	18 ft. 0 in.	18 ft. 0 in.	22 ft. 0 in.	22 ft. 0 in.	20 ft. 0 in.
e. Stock line diameter	14 ft. 9 in.	16 ft. 2 in.	.....	9 ft. 4 in.	12 ft. 6 in.	8 ft. 0 in.	14 ft. 0 in.	14 ft. 0 in.	16 ft. 0 in.	16 ft. 0 in.	14 ft. 0 in.
f. Hight	94 ft. 3 in.	82 ft. 3 in.	90 ft. 0 in.	72 ft. 4 in.	75 ft. 0 in.	60 ft. 0 in.	70 ft. 0 in.	70 ft. 0 in.	90 ft. 0 in.	90 ft. 0 in.	80 ft. 0 in.
g. Average daily product, tons	190	140	140	130	207	106	109	121	452	498	242
h. Yield of ore, per cent	.....	.....	41.5	63.5	59.0	52.0	.....	.....	51.0	52.6	52.2
i. Fuel per ton of iron, pounds	2,350	2,380	2,680	1,660	1,664	1,690	3,261	3,377	1,936	2,217	2,320
j. Ore per ton of iron, pounds	.....	.....	5,400	3,520	3,800	4,300	.....	.....	4,400	4,250	4,280
k. Limestone per ton of iron, pounds	.....	.....	1,830	606	771	.....	.....	.....	1,102	1,091	1,180
l. Ore plus limestone per ton of iron, pounds	7,320	7,620	7,230	4,126	4,571	.....	.....	.....	5,502	5,341	5,460
m. Ore per pound of fuel, pounds	.....	.....	2.01	2.12	2.20	2.55	.....	.....	2.27	1.92	1.84
n. Limestone per pound of fuel, pounds	.....	.....	0.68	0.36	0.46	.....	.....	.....	0.57	0.49	0.51
o. Ore plus limestone per pound of fuel, pounds	3.13	3.20	2.69	2.48	2.66	.....	.....	.....	2.84	2.41	2.35
p. Fuel per square foot of hearth per minute	1.96	2.29	2.75	2.66	2.86	3.33	3.25	3.75	3.42	4.23	2.86
q. Air per minute from (*p*) calculated on basis of 60 cu. ft. per pound of fuel	19,200	14,280	15,700	9,250	14,800	7,680	15,290	17,600	38,700	48,000	24,500
r. Average silicon in iron, per cent	Basic.	Basic.	1.00	1.6	1.23	1.0	.....	.....	1.27	1.10	2.50
s. Average sulphur in iron, per cent	.....	.....	.....	.....	.....	.....	.....	.....	0.044	0.049	.....
t. Temperature of blast, degrees F	.....	.....	.....	1,200	1,108	1,220	.....	.....	915	885	1,200

* *Transactions*, xx, 282 to 285 (1891).
† *Transactions*, xxvii, 477 to 485 (1897).

ning of its blast to the present time indicates that no error was made in the adoption of this theory of design.

The usual rate of driving in the United States with a modern equipment is approximately 4.25 lb. of fuel per square foot of hearth area per minute. With the data in hand it is not possible to develop a rule for the most economical rate of driving with relation to fuel, for high or low silicon irons, but it appears that for either kind of iron a rate less than 4 lb. is desirable, and it seems probable that a rate as low as 3 lb. may prove still more ecomonical, so far as fuel is concerned.

If the records of the furnaces operated by the United States Steel Corporation were tabulated and published in some such form as that suggested by this paper, no doubt exceedingly valuable deductions could be made as to the influence of the rate of driving upon the fuel economy. The knowledge thus obtained would be of great benefit to the blast furnace industry.

OBITUARY.

HENRY E. PRIDMORE.

Henry E. Pridmore, Chicago, died of apoplexy September 25, in Glasgow, Scotland. Accompanied by his son, Henry A. Pridmore, he was traveling for the benefit

HENRY E. PRIDMORE.

of his health, which for several years has been impaired. His condition, however, was not considered critical, and the announcement of his death came as a shock to his family and friends. From his long connection with leading implement manufacturing concerns, and his later prominence as an iron founder, Mr. Pridmore was widely and favorably known among a large circle connected with these industries. Born in Brockport, N. Y., September 21, 1854, he began his business career as a machinist's apprentice in his home city. Having served his time, he was successively engaged in mechanical work in Rochester, Palmyra, and Albany, N. Y. In the last named city his first connection with the agricultural implement business began. After engagements embracing service with the Johnston Harvester Company, now of Batavia, N. Y., and the firm of Warder, Bushnell, Glessner & Co., Springfield, Ohio, he went to Chicago in 1879 to accept a position in the works of the McCormick Harvesting Machine Company. Having become interested in the study of methods for the improvement of foundry practice, he embarked in business on his own account in 1892, and gradually developed a large foundry trade, in which the manufacture of molding machines of his own invention became the central product. He leaves four sons.

WILLIAM HOLLOWAY BAILEY, a pioneer in the brass and copper tube industry in this country, died at his residence in New York city October 5, aged 75 years. He had been connected with the American Tube Works of Boston for 58 years, and was the New York representative of the company for the last 50 years. He was a member of the Union League, Engineers' Club, Downtown Association, American Society of Mechanical Engineers, Society of Naval Architects and Marine Engineers, New York Yacht Club, Geographical Society, Metropolitan Museum of Art, Museum of Natural History, and the Academy of Design.

JOHN J. REARDON, president of the Central Foundry Company, Milwaukee, Wis., died September 28, after a long illness, aged 58 years. He had spent most of his life in the iron business, filling responsible positions as superintendent of departments with the Allis-Chalmers Company, Filer & Stowell and other large manufacturing concerns until two years ago, when he organized the Central Foundry Company, with three sons, James P., John E. and Daniel J., associated with him. Besides the sons, Mr. Reardon leaves a widow and six daughters.

JOHN M. KEMMERER died September 26 at his home in Scranton, Pa., aged 62 years. Born near Stroudsburg, in that State, he went to Scranton in 1863, when 17 years old, and three years later entered the hardware business as a member of the firm of A. Bittenbender & Co., a connection which was maintained until he died. Mr. Kemmerer was influential in the commercial life of the city, serving as chairman of the Finance Committee of the Board of Trade, and later as president of the board for two terms. At various periods he was Common Councilman and School Director, and he was prominent in Masonic orders. He leaves a widow, one son and a daughter.

Ensley September Records.—Under the management of Frank H. Crockard, the Ensley plant of the Tennessee Coal, Iron & Railroad Company has made some excellent records in September. The open hearth mill in the steel plant produced 43,366 tons of steel, against 41,469 tons in July, 1908, the best previous record date. The blooming mill turned out 40,968 tons of steel against 39,056 tons in August last, the best previous record to date. The rail mill produced 34,032 tons of rails, against 32,240 tons in August, 1908. Alice Furnace, manufacturing basic iron, produced 7,532 tons of iron, against 7,452 tons in August, while the Bessemer No. 4 furnace produced 6,238 tons of iron, against 6,123 tons in August. The production of hard ore in September went to 124,555 tons, against 124,339 tons in March, 1907, the best previous record to date. In brown ore the figures show a production of 19,440 tons last month, against 19,140 tons in August. The records of daily production show that 1,557 tons of rails were produced on September 25, the highest previous record being 1,508, on the 17th of the same month. The Ensley No. 5 blast furnace produced 438 tons of iron September 30, against a record for one day of 383 tons in April, 1908.

The Standard Sanitary Mfg. Company, Pittsburgh, has completed plans for a new foundry at New Brighton, Pa. The building will be 140 x 180 ft., and will be constructed of steel and concrete. The new foundry will be supplied with modern cupolas, machine molding equipment and the most improved appliances, which will largely increase the capacity of the plant for manufacturing castings. The improvements will cost about $100,000. The company has also arranged for the erection of a new enameling building, to be erected at the Louisville, Ky., plant, which will be 75 x 210 ft.

Since the war with Japan the mileage of the Chinese railroads has materially increased. Including the Manchurian railroads there are now 3200 miles of road in operation, an equal amount projected and 1100 miles building. In northern China and in Manchuria Russian influence has decreased.

Pig Iron Output Grows.

September Product 1,418,998 Tons.

Active Capacity October 1 Two-thirds That of a Year Previous.

September, with one day less than August, shows a production of coke and anthracite pig iron about 60,000 tons greater, or 1,418,998 tons, against 1,359,831 tons. The weekly capacity of furnaces in blast on October 1 was 337,925 tons, or 66 per cent. of the capacity active at the beginning of the high record month of October, 1907. The steel works furnaces produced 933,514 tons last month and the merchant furnaces 485,484 tons. The daily rate for the steel works was thus 31,117 tons in September, or 7.5 per cent. greater than in August, while the merchant furnace output was 16,183 tons a day, or 8.6 per cent. greater than in August. The daily output of the coke and anthracite furnaces was 40 per cent. greater in September than in January. The number of furnaces in blast October 1 was 188, or 9 more than on September 1, 27 more than on August 1, and 37 more than on July 1. Of the gain of 9 in September, 8 belong to the merchant furnace list. The daily rate of production by months for this year is as follows:

Daily Rate of Production.—Gross Tons.

	Steel works.	Merchant.	Total.
January	21,432	12,286	33,718
February	25,717	11,446	37,163
March	27,145	12,474	39,619
April	24,185	14,104	38,289
May	24,505	13,098	37,603
June	23,923	12,521	36,444
July	25,762	13,525	39,287
August	28,952	14,899	43,851
September	31,117	16,183	47,300

Capacity in Blast October 1 and September 1.

In the following table is given the weekly capacity of coke and anthracite furnaces in blast October 1 and September 1, based largely on their performance in the preceding month in each case:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	October 1. Number in blast.	October 1. Capacity per week.	September 1. Number in blast.	September 1. Capacity per week.
New York:					
Buffalo	14	10	23,303	9	18,209
Other New York	7	3	3,926	3	3,510
New Jersey	8	2	3,855	2	3,808
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	9	9,713	8	8,628
Spiegel	3	1	130	1	138
Schuylkill Valley	15	5	6,421	4	5,551
Low. Susquehanna	7	2	3,335	2	3,278
Spiegel	1	0	0	0	0
Lebanon Valley	10	3	2,305	3	2,058
Pittsburgh Dist	45	31	81,841	31	81,762
Spiegel	3	2	1,956	2	1,556
Shenango Valley	20	11	20,853	11	21,527
West. Penn	27	13	19,047	11	16,524
Maryland	4	2	3,905	2	3,617
Wheeling Dist	14	3	5,462	3	5,502
Ohio:					
Mahoning Valley	18	11	26,507	9	23,261
Central and North. and Michigan	22	12	28,996	12	28,110
Hocking Val., Hanging Rock and S. W. Ohio	13	4	3,603	7	5,232
Illinois and Indiana	24	15	37,208	15	33,215
Spiegel	2	0	0	1	1,678
Minnesota	1	0	0	0	0
Wisconsin	6	1	1,785	1	1,502
Missouri and Colorado	7	4	6,002	3	4,666
The South:					
Virginia	23	9	7,004	10	6,995
Kentucky	5	1	1,050	0	0
Alabama	46	22	31,948	20	27,738
Tennessee	18	11	7,220	9	5,047
Georgia and Texas	3	1	550	0	0
Totals	393	188	337,925	179	313,112

The list of furnaces blown in in September includes one Colorado, one Buffalo & Susquehanna at Buffalo, one Warwick in the Schuylkill Valley, one Thomas in the Lehigh Valley, one Shenango in the Shenango Valley, Earlston and one Cambria in Western Pennsylvania, Norton in Kentucky, Cleveland in Northern Ohio, Brier Hill and Haselton No. 1 in the Mahoning Valley, one Sloss-Sheffield and Woodstock in Alabama, Citico and one Rockwood in Tennessee, and Rome in Georgia.

Furnaces blown out in September were New Castle No. 3 in the Shenango Valley, Dover in Central Ohio, and Bessie in the Hocking Valley, Crozer in Virginia, Globe and Marting in the Hanging Rock Region, one Joliet in Illinois.

September Product by Districts.

The table below gives the production of coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)
New York	64,746	61,249	66,498	83,004	108,453
New Jersey	20,889	15,963	14,830	16,866	16,544
Lehigh Valley	28,712	26,357	28,028	36,701	42,184
Schuylkill Val.	25,566	23,814	25,115	24,586	23,918
Lower Susquehanna and Lebanon Val.	29,943	31,058	26,204	23,632	24,170
Pittsburgh Dis.	284,571	259,771	303,645	362,417	359,132
Shenango Val.	53,720	58,244	82,978	91,534	93,372
West. Penn	54,185	59,521	63,433	73,207	72,633
Md., Va. and Kentucky	49,273	46,802	46,635	47,492	50,150
Wheeling Dis.	18,121	16,539	19,405	24,368	23,409
Mahoning Val.	99,788	89,238	93,635	103,021	102,606
Central and North. Ohio	88,995	70,283	92,737	117,016	119,163
Hocking Valley Hanging Rock and S.W.Ohio	21,259	20,342	20,187	19,909	22,376
Mich.,Minn.,Mo., Wis., Colo.	36,831	34,363	40,029	35,542	39,408
Chicago Dis.	165,291	153,162	152,981	156,537	167,896
Alabama	104,697	110,196	123,301	122,840	126,137
Tennessee, Georgia and Texas	19,101	15,229	18,488	21,159	27,447
Totals	1,165,688	1,092,131	1,218,129	1,359,831	1,418,998

Production of Steel Companies.

Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production. 1906.	1907.	1908.	Spiegeleisen and ferromanganese. 1907.	1908.
January	1,358,015	1,406,397	664,415	21,477	20,254
February	1,226,760	1,317,923	745,802	19,444	9,402
March	1,400,395	1,424,827	841,502	31,091	13,750
April	1,333,591	1,446,788	725,548	26,527	12,363
May	1,372,423	1,470,080	759,674	28,822	17,823
June	1,293,437	1,457,230	717,689	30,942	15,958
July	1,323,391	1,452,557	798,639	25,343	10,250
August	1,237,485	1,445,685	897,052	23,696	14,932
September	1,264,380	1,417,153	933,514	30,270	8,938
October	1,452,200	1,514,521	.....	35,105	.....
November	1,411,350	1,084,114	.....	21,861	.....
December	1,445,528	659,459	.....	19,480	.....

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1904:

	Capacity per week.		Capacity per week.
October 1, 1908	337,925	May 1	484,031
September 1	313,112	April 1	484,240
August 1	284,590	March 1	479,737
July 1	264,452	February 1	482,156
June 1	259,284	January 1, 1906	463,673
May 1	268,674	December 1, 1905	475,814
April 1	264,890	November 1	460,449
March 1	267,437	October 1	445,468
February 1	241,925	September 1	412,563
January 1, 1908	232,652	August 1	410,088
December 1, 1907	347,372	July 1	408,617
November 1	491,436	June 1	443,092
October 1	511,397	May 1	452,031
September 1	507,768	April 1	439,564
August 1	513,471	March 1	403,157
July 1	528,170	February 1	405,792
June 1	523,220	January 1, 1905	377,879
May 1	524,538	December 1, 1904	357,846
April 1	496,456	November 1	334,249
March 1	511,035	October 1	319,249
February 1	492,359	September 1	291,573
January 1, 1907	507,397	August 1	246,092
December 1, 1906	513,860	July 1	272,301
November 1	500,580	June 1	336,107
October 1	469,665	May 1	368,244
September 1	441,426	April 1	337,257
August 1	449,908	March 1	308,751
July 1	460,570	February 1	273,692
June 1	472,622	January 1, 1904	185,636

To avoid the undue oxidation often attending the melting of small aluminum scrap, the following suggestion is made by the *Foundry*: It is advisable to melt the heavier pieces first in a large crucible and when the metal has reached a red heat the smaller pieces of scrap and borings can be added. The borings should be pushed down into the molten bath as rapidly as possible and the metal should be well stirred.

NEWS OF THE WORKS.

Iron and Steel.

The blast furnace of the Midland Steel Company at Midland, Pa., which has been shut down for several months, will probably be started up about October 10. It has a daily capacity of 350 to 400 tons.

The Brier Hill Iron & Coal Company, Youngstown, Ohio, has completed the rebuilding of its Grace Furnace and the stack has been started. It is 21 x 85 ft., with four stoves, each 19½ x 85 ft., and has a daily capacity of 350 to 400 tons. A new blowing engine was installed at the furnace, built by the William Tod Company of Youngstown.

The new blast furnace of the Jackson Iron & Steel Company, Jackson, Ohio, was blown in this week.

The blast furnace of the Warner Iron Company, at Cumberland Furnace P. O., Tenn., will be blown out about November 1 for repairs.

No. 2 furnace of the Alabama Consolidated Coal & Iron Company, at Gadsden, Ala., has been put in blast.

General Machinery.

The Standard Bridge Tool Company, Curry Building, Pittsburgh, Pa., builder of spacing tables and machinery for structural plants, has been awarded a contract by the Western Steel Car & Foundry Company, Burnham, Ill., for a special angle punch and spacing table.

M. C. Ducrow, Natchez, Miss., inventor of a loading and unloading machine, and others contemplate organizing a company to put the machine on the market.

Power Plant Equipment.

The important changes and improvements to the plant of the Union Boiler & Mfg. Company, Lebanon, Pa., will considerably increase the capacity and enable the company to take care of the increasing demand for its products, which include steam boilers, tanks, smokestacks and blast furnace work; the latter of which it makes a specialty. The new additions, which are about completed, are of brick and steel and include two new bays adjoining the main shop, 29 x 64 ft., and a new wing, 32 x 40 ft. The shop with the additional room is now 58 x 202 ft. A new wing on the west side of the plant, 46 x 74 ft., will be used for storage purposes and one of the new bays is to be used for the blacksmith and flanging department. In the west of the main building there is installed a 5-ton traveling crane with 25-ft. span, and under the crane will be a 75-ton hydraulic riveter for riveting boiler shells and other work. The main shop has been equipped with a 15-ton traveling crane with a 3-ton auxiliary hoist, 53 ft. span, which travels the full length of the shop. In the new blacksmith shop an 800-lb. steam hammer is being installed to take the place of the small one, which has been discarded. Shipping facilities are furnished by the Philadelphia & Reading Railroad, a siding from which runs through the new shop. The present officers are Robert Mitchell, president; John J. Hursh, vice-president; H. T. Richards, secretary; John Hunsicker, treasurer, and William H. Schools, superintendent.

For the improvement of the electric light and water systems the city of Sherman, Texas, has authorized a $30,000 bond issue. Of this sum $16,000 will be devoted to improvement of the electric light plant and $14,000 for the water works system. Specifications for this work have not yet been prepared.

The trustees of Rye, N. Y., will receive bids until October 28 for the construction of sanitary sewers and a sewage disposal plant, the requirements including 12,600 ft. of 4 to 16 in. iron pipe, two small pumping stations, &c.

The Brooklyn Rapid Transit Company is to erect a new substation on Thirty-eighth street, near Fifth avenue, Brooklyn, N. Y., at a cost of $65,000. The building will be 50 x 100 ft., and at the start will be equipped with a 2000-kw. rotary converter, which we understand has been contracted for. It is probable that other equipment will be added later.

The Montgomery Light & Water Power Company, Montgomery, Ala., intends to spend about $100,000 in making improvements to its plant, the greater part of the amount to be expended on the power plant at Tallasee Falls, about 30 miles from Montgomery. It is estimated that 10,000 additional horsepower will be developed.

The National Valve & Mfg. Company, Pittsburgh, Pa., has received a contract for installing a high pressure steam line in the plant of the American Steel & Wire Company, Cuyahoga Falls, Ohio.

The Auburn Light, Heat & Power Company, Auburn, N. Y., is taking bids on power house building, 60 x 75 ft., to be erected on the site of the present power building. The building will be equipped with a 10-ton traveling crane, one 500-hp. upright boiler, feed pumps, condenser, generators and other equipment. Part of the present equipment will be utilized in the new plant.

Contracts for construction and equipment of the new water works system to be constructed at Shortsville, N. Y., have been awarded as follows: Cast iron pipe and specials to Charles Miller & Son, Utica, N. Y.; pipe at $23.50 per ton and specials at 2½ cents per pound; hydrants and valves, Ludlow Valve Mfg. Company, Troy, N. Y.; pumps and motors, Goulds Mfg. Company, Seneca Falls, N. Y. The contract for steel tank and tower has not yet been awarded.

The United Coke & Gas Company, New York, has the contract for the by-product ovens, the main condenser house and the power plant for the new Citizens' Gas Company, at Indianapolis, Ind.

Foundries.

The Nash Foundry Supply Company, which has been in business in Birmingham, Ala., for the past eight years, and which has enlarged its plant three times in that period, has incorporated its business, adding $15,000 to its capital and taking in L. A. Christian as secretary and treasurer. The company has a modern foundry facing plant and is prepared to ship goods the day the order is received. D. W. Nash is president.

The Bellevue Pipe & Foundry Company, Bellevue, Ohio, has filed a schedule in the United States District Court at Toledo in which it places its debts at $41,099.74 and assets at $124,-483.33. The schedule was filed in response to an involuntary petition in bankruptcy by creditors entered August 30.

Bridges and Buildings.

W. N. Kratzer & Co., Pittsburgh, Pa., fabricators of structural steel, have received a number of orders recently which necessitated increasing the number employed at the plant by about 40 men. The firm reports that inquiries are improving and future prospects are better than for some time.

Fires.

The machine shop of the E. L. Jones Steel Ball Company, at Buffalo, N. Y., was burned October 3, the loss being about $25,000. Part of the company's plant was burned about two months ago.

The plant of the Pittsburgh Plate Glass Company, at Tarentum, Pa., was burned October 4, the loss being about $200,000. It is stated that many of the polishing machines were destroyed.

The cutting mill of the Williamsport Nail Works, Williamsport, Pa., was destroyed by fire October 5, the loss being about $50,000.

Hardware.

The Mulholland Company, Dunkirk, N. Y., manufacturer of Mulholland springs, shaft couplers and rubber tires and builder of vehicles, has just completed an addition to its factory which admits of increased output and enables the company to fill its orders more promptly.

The National Cutlery Company, Philadelphia, Pa., reports business as such that it is necessary to run the plant from 7 a.m. until 9 p.m. Orders on the company's books indicate that this condition of affairs will continue for at least a period of six months

Miscellaneous.

The Mount Union Silica Brick Company, Mt. Union, Pa., is improving its plant by building three new 85-ft. tunnels of steel and concrete construction, for use in connection with its heating and drying system, and a new airproof brick lime house, 16 x 64 ft. This plant has a daily capacity of 50,000 brick.

The Twin City Boiler & Sheet Iron Works, Bristol, Tenn., has been incorporated with a capital stock of $20,000 by Henry Ehret, president; J. P. Oakes, vice-president, and J. G. Tilley, secretary and treasurer. The company has begun operations in its plant and has purchased all the required machinery with the exception of a second-hand welder, for which it is in the market.

The Pittsburgh Gage & Supply Company, Pittsburgh, Pa., is installing high pressure steam lines for the Brownsville Water Company, Brownsville, Pa., and the Pittsburgh-Belmont Coal Company, Neffs, Ohio. The company also has contracts for installing continuous oiling systems equipped with White Star filters for the following: Wickwire Steel Company, Buffalo, N. Y.; Packard Motor Car Company, Detroit, Mich., and the P. F. Wood Boiler Company, New Bedford, Mass.

The Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, works at Rochester, Pa., has received a number of very satisfactory reports from tests made on trial orders of grinding wheels recently shipped to various sections of the country, and the company received last week quite a number of orders for its emery wheels.

The Waverly Company, recently organized, which bought the Indianapolis, Ind., plant of the Pope Motor Car Company, has elected the following officers: President, Wm. B. Cooley; vice-president, H. H. Rice; secretary, Wilbur C. Johnson; treasurer, Carl von Hake.

The Childs Automobile Company, a newly organized concern, has rented the building on Siegrist street, Newark, N. J., formerly occupied by the Reed Mfg. Company, and will engage in the manufacture of automobiles. S. H. Mora of the Mora Motor Car Company is president of the new company.

Some time ago the Crane Company, Chicago, bought a large tract of land at Verona, Pa., near Pittsburgh, on which to build a plant for the manufacture of its products. The company now states that nothing will be done in the way of building this year.

The Iron and Metal Trades

Pig Iron Production Increasing.

The Whole Trade Is Marking Time Awaiting the Elections.

Pig Iron production has made quite marked progress since the summer's lull. In June the output had declined to 36,500 tons per day. In September it averaged 47,300 tons per day, and we entered October with a daily capacity of over 48,000 tons. This is at the rate of over two-thirds of the production of the banner month, October of last year.

The September production was 1,419,000 tons, of which the Steel works furnaces made 933,500 tons and the merchant furnaces 485,500 tons. Unfortunately no statistics of stocks are available, so that it is impossible to judge whether consumption is taking care of all the current make. It is well known, however, that in some leading districts the accumulations have been considerably reduced, while in others makers being able to carry their Iron are content to wait for a turn for the better. One feature is that consumers' yards are bare all over the country.

The whole line of the crude and finished branches of the Iron trade is simply marking time. It is only under exceptional circumstances that buyers surrender their reserve, preferring to await developments, however confident they may feel that a spell of increased activity will follow the elections.

There are few items of interest to report. The material for the 5000 Steel underframe cars for the St. Paul road has been placed, 12,000 tons of Shapes and Plates going to the Illinois Steel Company and 10,000 tons of 20-inch Beams to the Bethlehem Steel Company.

A very considerable number of contracts for Structural Material are shaping up in different parts of the country, but comparatively little work has been actually given out lately. Complaints continue to be heard of very low prices made by fabricators.

There has been quite a movement in Heavy Melting Scrap in the eastern Pennsylvania District, three or four mills purchasing an aggregate of about 14,000 tons, one-half by one party. The prices paid range from $15 to $15.50, the bulk of the business being placed at the lower figure. On the other hand, Chicago reports that four roads are offering in that market, this week, a total of about 16,000 tons of Old Material, which shows larger lists than for some time past.

The export trade is developing well. September was considerably above the normal. Among recent orders was a lot of 8000 tons of Structural Material for Canada, which practically marks the end of that movement for the present. We note also the sale of a good lot of Oil Pipe for the Burmah fields.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 7, 1908.	Sept. 30, 1908.	Sept. 2, 1908.	Oct. 2, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$16.75**	$16.75	$16.50	$20.00
Foundry No. 2, Southern, Cincinnati	**15.75**	15.75	15.50	21.25
Foundry No. 2, Local, Chicago	*16.50*	16.50	17.00	22.50
Basic, delivered Eastern Pa.	**15.50**	16.00	15.25	18.50
Basic, Valley Furnace	*14.25*	14.25	14.50	19.50
Bessemer, Pittsburgh	15.90	15.90	15.90	22.90
Gray Forge, Pittsburgh	*14.40*	14.40	14.65	20.40
Lake Superior Charcoal, Chicago	19.50	19.50	19.50	26.50
BILLETS, &c., Per Gross Ton:				
Steel Billets, Pittsburgh	25.00	25.00	25.00	28.50
Forging Billets, Pittsburgh	27.00	27.00	27.00	32.00
Open Hearth Billets, Phila	26.20	26.20	26.20	31.00
Wire Rods, Pittsburgh	33.00	33.00	33.00	36.00
Steel Rails, Heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*14.75*	14.75	15.00	17.00
Steel Rails, Melting, Phila	*15.00*	15.00	15.25	16.50
Iron Rails, Chicago	**18.00**	18.00	16.75	20.25
Iron Rails, Philadelphia	**20.50**	20.50	20.00	20.50
Car Wheels, Chicago	*15.25*	15.25	16.00	24.00
Car Wheels, Philadelphia	15.00	15.00	15.00	23.00
Heavy Steel Scrap, Pittsburgh	**15.00**	15.00	14.25	17.50
Heavy Steel Scrap, Chicago	13.00	13.00	13.00	15.00
Heavy Steel Scrap, Phila	*15.00*	15.00	15.25	16.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.45	1.45	1.45	1.75
Common Iron Bars, Chicago	1.50	1.50	1.50	1.78
Common Iron Bars, Pittsburgh	1.40	1.40	1.40	1.70
Steel Bars, Tidewater, New York	1.56	1.56	1.56	1.81
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.60
Tank Plates, Tidewater, New York	1.76	1.76	1.76	1.86
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.70
Beams, Tidewater, New York	1.76	1.76	1.76	1.86
Beams, Pittsburgh	1.60	1.60	1.60	1.70
Angles, Tidewater, New York	1.76	1.76	1.76	1.86
Angles, Pittsburgh	1.60	1.60	1.60	1.70
Skelp, Grooved Steel, Pittsburgh	1.45	1.45	1.45	1.85
Skelp, Sheared Steel, Pittsburgh	1.50	1.50	1.50	1.95
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, Black, No. 28, Pittsburgh	2.50	2.50	2.50	2.60
Wire Nails, Pittsburgh	1.95	1.95	1.95	2.05
Cut Nails, Pittsburgh	1.80	1.80	1.80	2.10
Barb Wire, Galv., Pittsburgh	2.40	2.40	2.40	2.50
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*13.75*	13.75	13.87½	15.00
Electrolytic Copper, New York	*13.50*	13.37½	13.75	14.75
Spelter, New York	4.85	4.80	4.75	5.40
Spelter, St. Louis	4.70	4.65	4.60	5.20
Lead, New York	*4.45*	4.47½	4.57½	4.68
Lead, St. Louis	*4.30*	4.32½	4.45	4.52
Tin, New York	29.50	29.62½	29.00	34.70
Antimony, Hallett, New York	7.75	7.75	8.00	11.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, October 7, 1908.—(*By Telegraph.*)

Orders placed last week for material required to build the 5000 Steel underframes for the new Chicago, Milwaukee & St. Paul cars added 22,000 tons to the new business entered by rolling mills. This was divided between the Illinois and the Bethlehem Steel companies, the former taking 12,000 tons of Angles, Channels, Zee Bars and Small Beams and Plates and the latter securing 10,000 tons of 20-in. Beams. Another item of pertinent interest as foreshadowing further mill business is the placing of an order by the Chicago & Alton Railroad for 1000 Steel cars. This is a duplicate of the contract let some weeks ago to the Standard Steel Car Company. Orders taken by the principal interest in September foot up considerably in excess of the current weekly estimates for that period. The summary for the month shows a gain of nearly 30 per cent. in tonnage over August. The largest increases were in Structural Shapes and Bar Steel, with a moderate improvement in Track Supplies. Plates, Tubular Goods and Light Steel Rails held about even. A liberal purchase of Billets for forward requirements is noted in an order entered by the Inland Steel Company for 25,000 tons to be converted into Car Springs. While there is not much doing in Standard Rails, railroad activities in other directions are improving. In addition to the new car orders recently placed there is considerably more buying of supplies and material for repair work. None of the more notable structures now under consideration involving large

amounts of fabricated material was included in last week's closures. An early award of the new Northwestern Depot is expected, and the prospects are that before the end of the year much of the business now in sight will have been concluded. Sheets, especialy Galvanized and Corrugated, are in fair demand, and Merchant Pipe continues to hold its own.

Pig Iron.—There has been nothing in the market events of the past week that can be construed as evidencing a change of attitude on the part of either buying or selling interests respecting purchases and sales of Pig Iron. As has been the case for two or three weeks, the quantities bought consist principally of small lots for immediate consumption. Even orders of this character are, however, widely scattered, and by no means numerous. The Southern furnaces have for the present ceased to be a factor in this market since the lowest price made by any of these interests is above that at which the Northern furnaces are willing to sell. None of the local makers is carrying burdensome stocks, and but for the threatening competition of southern Ohio and Valley producers it is likely that prices of Lake Superior Iron would firm up at least 50c. a ton above the minimum now ruling. The principal transaction reported for the week was the purchase of 1300 tons of Malleable Bessemer by a prominent implement manufacturer for shipment within 30 days. This Iron will be supplied by a local furnace. A lot of 800 tons of Northern Iron for delivery through the first half was taken by a manufacturer of machinery. The National Malleable Castings Company is credited with the purchase of 12,000 to 15,000 tons of Malleable Iron, and while general credence is given the report it is not definitely confirmed. Few new inquiries are coming in, and negotiations for next year's deliveries are at a standstill. Consumers and producers alike are holding off, both being indisposed to take the initiative on future business at this time. The following quotations are for October, November and December delivery, f.o.b. Chicago:

Lake Superior Charcoal	$19.50 to $20.00
Northern Coke Foundry, No. 1	17.00 to 17.50
Northern Coke Foundry, No. 2	16.50 to 17.00
Northern Coke Foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern Coke, No. 1	17.35 to 17.85
Southern Coke, No. 2	16.85 to 17.35
Southern Coke, No. 3	16.35 to 16.85
Southern Coke, No. 4	15.85 to 16.35
Southern Coke, No. 1 Soft	17.35 to 17.85
Southern Coke, No. 2 Soft	16.85 to 17.35
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	17.65 to 18.10
Jackson Co. and Kentucky Silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—The principal transaction in Billets comprises a sale made to the Railway Steel Spring Company, Detroit, by the Inland Steel Company. The entire order includes a round quantity of Steel, the amount of which is not definitely stated by the sellers, but is supposed to be about 25,000 tons. A good proportion of the whole, it is stated, is made up of rolling Billets. Deliveries extend into next year, being scheduled to take advantage of water freights. Other sales are made up in the main of car lots of Forging Billets, the agregate tonnage of which is on the whole slightly increased. Forging Billets continue reasonably firm, at $28.50, base, Chicago. The demand for Wire Rods is, all things considered, quite satisfactory. We quote the following prices, which are reported to be firmly held: Bessemer, $33; Basic, $34; Chain, $33, all at Pittsburgh.

Rails and Track Supplies.—Specifications for 5000 tons of Standard Rails have been received by the Illinois Steel Company from the Northern Pacific. Not much new business is being entered, save in small lots, for immediate shipment. Among the orders of this kind taken by the Illinois Steel Company was one of 700 tons, from the Van's Harbor Land & Lumber Company, Manitou Island, Mich. The demand for Track Supplies shows considerable improvement, among the orders entered by the principal interest being one of 1200 tons of joint connections from the Southern Pacific; 2000 kegs of Spikes from the Missouri Pacific, and 2000 from the Illinois Central. Light Rails continue fairly active, the orders booked by the Illinois Steel Company totaling about 1200 tons per week. Prices on Light Rails are somewhat firmer, though concessions of $1 to $2 a ton are occasionally made to meet the competition of rerolling mills. As compared with August, the bookings for railroad material for September make, on the whole, an advantageous showing. Some increase is noted in Standard Rail specifications received by the principal interest, while Track Supplies show considerable improvement. Orders for over 3000 kegs of Bolts and 7000 kegs of Spikes in excess of August sales were taken in September. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to 1.90c., according to delivery: Track Bolts, 2.10c. to 2.15c., base. Square Nuts, and 2.25c. to 2.30c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $26; 20-lb., $27; 16-lb., $28; 12-lb., $29. Standard sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The Brown-Ketcham Iron Works, Indianapolis, is reported to have secured the contract for 1355 tons of Structural Material to be used in building the St. Louis Post Office. The outside contracts taken by the American Bridge Company in the past week were made up of a number of unimportant contracts aggregating about 3000 tons, but a continuation of new construction at Gary by the Steel Corporation is furnishing this interest with a good deal of new work. Plans for the new City Hall, calling for between 11,000 and 12,000 tons, are now in the hands of fabricators for figures. Bids on the Keithsburg Bridge are in, but no award has as yet been made. Figures on the new Northwestern Depot go in today, and it is believed that contracts for this work will be let without undue delay. Though but a modest proportion of the business in sight reached closure during September, the final summing up for the month shows a marked improvement in mill specifications over August. In fact, the largest increase of tonnage in the mills of the Illinois Steel Company is found in this department, which, it is reported, has more than doubled the record for August. Prices from store are 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c.

Plates.—Greater activity in new car construction is to a large degree responsible for the improvement noted in new Plate orders. Of the contract taken last week by the Illinois Steel Company for 26,000 tons of Structural Plates, comprising the requirements for underframes of 5000 cars for the Chicago, Milwaukee & St. Paul, a considerable proportion of the whole will go to the Plate mills. Specifications on this material will be begun at once. Not much new business is coming from the boiler shops, nearly all of which are running very slack. Price conditions show no radical change, but there is still a disposition among some mills, principally those rolling limited sizes, to shade prices from $1 to $2 a ton. We quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c.; No. 8, up to 60 in. wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for Sheets holds fairly even. The Inland Steel Company is operating its Sheet department at between 55 and 60 per cent. of capacity. The principal distributers are receiving a good many orders, but they are generally for small lots to supply immediate needs. Galvanized Corrugated Sheets are in fair demand, and the volume of business is reported to be gradually increasing. Prices are reasonably firm, and the sources from which cuts of $1 to $2 a ton can be obtained are not so plentiful as they were some time ago. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.15c.; No. 12, 2.20c.; No. 14, 2.25c.; No. 16, 2.35c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The movement in Bars through the month of September was somewhat fluctuating, so that it was difficult to estimate from weekly reports what was actually being done. A summary of specifications received by the principal interest, however, shows that the bookings for September were practically double those of August. Generally speaking, manufacturers are gauging their orders closely to current consumption, and are not stocking far ahead of present needs. The outside mills in this district are not yet well enough supplied with specifications to run without interruption. Trade in Bar Iron is quiet and shows but little, if any, increase in new business. Prices on Steel Bars are reported to be firmly maintained and on Iron Bars are reasonably steady at current quotations. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13, and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge, and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as

per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—No new impetus has developed in the past week that would tend to materially increase the volume of business. A few jobbers have placed stock orders for requirements farther ahead than usual, but in the main purchasers contemplate replenishments for anticipated needs for not more than 30 or 60 days ahead. Actual consumption, however, is great enough to prevent any backward movement. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, ¾ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Black Steel Pipe, ¾ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Conditions among the manufacturers of Boilers are not sensibly improved, and the demand for Merchant Tubes from this source is extremely quiet. There is, on the other hand, a little more doing in Locomotive Tubes as the work of repairing motive power equipment progresses. Mill quotations, for future delivery, on the base sizes, are as follows: 2¾ to 4¼ in., inclusive, Steel Tubes, 63.2; Iron, 50.2; Seamless, 50.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Specifications from the implement makers in September showed a fair margin of increase over those of the preceding month. The continued insistence upon prompt shipment of orders makes it apparent that manufacturers are relying upon the promptness of the mills for their stock supplies. A few are specifying for their season's supply on scheduled shipments, but they are the exception, and not the rule. We quote as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish, up to 1½ x ½ in., 1.73c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.58c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.08c., and 1½ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.08c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Cold Rolled Shafting on contracts for 100 tons and over, 57 per cent. off; 56 per cent. off in car lots; 52 per cent. in less than car lots, on which carload freight is allowed within base territory.

Cast Iron Pipe.—The market is barren of any transactions involving large tonnage, and last week developed but few lettings of any kind. A few hundred tons awarded by Winfield, Kan., was secured by a general contractor, and the Pipe has not yet been purchased. A lot of 900 tons for Hope, Ark., is up for letting this week. Prices are reported to be somewhat firmer on miscellaneous orders, but competitive jobs still develop keen competition. There is very little demand for Gas Pipe, and the season is too far advanced to expect much in this line. Prices are unchanged, and we quote nominally, per net ton, Chicago, as follows: Water Pipe, 4 in., $27; 6 to 12 in., $26; 16 in. and up, $25, with $1 extra for Gas Pipe.

Metals.—Buying is almost wholly confined to the purchase of small lots for present needs. There is but little inquiry and fewer sales of carloads are being made. Prices, in spite of the sluggish demand, hold fairly even on the entire line of Metals at present levels. Quotations are as follows: Casting Copper, 13½c.; Lake, 13¾c. to 14c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32½c.; small lots, 34½c.; Lead, Desilverized, 4.60c. to 4.65c., for 50-ton lots; Corroding, 4.85c. to 4.95c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.80c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13¼c.; Copper Bottoms, 12c.; Copper Clips, 13¼c.; Red Brass, 12c.; Yellow Brass, 9½c.; Light Brass, 7c.; Lead Pipe, 4.30c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Old Material.—The demand from the Iron foundries is somewhat better, though frequent purchases of small lots are the rule. There is no special activity in Steel melting stock, but the moderate offerings that have been coming out are readily absorbed. No. 1 Cast Scrap is in fair demand, and prices have firmed up slightly in the past week. Dealers are buying conservatively, and no large additions are being made to the heavy stocks, which the leading interests are carrying in their yards. More material will be offered by the railroads this week than for some time. Four Western lists, with an aggregate of over 16,000 tons, will be closed, distributed as follows: Northern Pacific, 10,000 tons; Santa Fe, 2100 tons; Chicago & Northwestern, 4000 tons, and the Wisconsin Central, 220 tons. The following prices are per gross ton, f.o.b. Chicago:

Old Iron Rails	$18.00 to $18.50
Old Steel Rails, rerolling	15.50 to 16.00
Old Steel Rails, less than 3 ft	14.75 to 15.25
Relaying Rails, standard sections, subject to inspection	19.50 to 20.00
Old Car Wheels	15.25 to 15.75
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards, cut apart	13.50 to 14.00
Mixed Steel	10.25 to 10.75

The following quotations are per net ton:

Iron Fish Plates	$16.50 to $17.00
Iron Car Axles	20.00 to 20.50
Steel Car Axles	17.50 to 18.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	13.25 to 13.75
No. 1 Dealers' Forge	10.25 to 10.75
Mixed Busheling	8.25 to 8.75
Iron Axle Turnings	7.00 to 7.50
Soft Steel Axle Turnings	7.00 to 7.50
Machine Shop Turnings	7.00 to 7.50
Cast Borings	5.50 to 6.00
Mixed Borings, &c	5.50 to 6.00
No. 1 Mill	8.00 to 8.50
No. 2 Mill	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	8.50 to 9.00
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	12.50 to 13.00
Agricultural Malleable	11.00 to 11.50
Pipes and Flues	10.00 to 10.50

St. Louis.

ST. LOUIS, October 5, 1908.

With some interests the demand for Finished Iron and Steel is steadily increasing, though in most cases the gain in volume is moderate. The larger companies, who depend on railroads for orders for new equipment, are still lacking new business, but even these are busy on repair work. A feature with some houses is the urgency of the demand for all kinds of Track Material, owing to the requirements of the railroads. Inquiry has been made by one of the leading railroads for a considerable tonnage of Standard Rails. The leading interest reports the demand for Merchant Pipe improving. Jobbers state that the demand from consuming trade is steadily increasing. The principal interest reports the demand for Wire is gaining steadily, especially from the manufacturing trade requiring special Wires. Barbed Wire and Steel Fences continue fairly active. A leading Metal company states that the increase in its business for September amounted to $25,000 over the previous month.

Coke.—Shipments of Coke are not moving out as fast as required by consumers. While numerous inquiries are out, they are mostly for small lots for prompt shipment, and the market is not active. The tone of the market rules firm. We quote $2.25 to $2.50, f.o.b. oven, for 72-hr. Connellsville Foundry. We hear that Virginia is tightening up and taking no business for 1909.

Pig Iron.—The views of the leading handlers of Pig Iron concerning the state of the demand for the present week vary. Some report a fair degree of activity and others state that it is ruling quiet. A feature of the situation is the readiness with which specifications on contracts are furnished; in fact, in some cases shipments are requested that anticipate the delivery. There is, however, considerable September Iron not yet shipped, and it is feared that the Birmingham District will be behind on shipmnets during the present month. Taking up the situation in detail, a leading seller regards the market in a healthy condition and reports the sale of 4000 tons of assorted grades, part of which is for shipment over last quarter of this year and first quarter of 1909, the price being equal to an average of $13.50 for No. 2 Foundry f.o.b. Birmingham. The agency of a large Southern producer reports booking a contract for 2000 tons No. 2 Foundry at $13, shipment over first quarter of 1909. The receipt of inquiries is reported by another house for 1500 tons No. 2 Foundry, shipment over the balance of this year and the first quarter of 1908; also for 2000 tons Malleable Bessemer shipment over fourth quarter of 1908 and first quarter of 1909. The market range in price for 1908 Iron is $12.50 to $13, according to freight rate. For first quarter 1909 we learn of sales at $13 for No. 2 Foundry f.o.b. Birmingham. There is not believed to be much resale Iron on this market. Several producers have practically withdrawn from the market for 1908 delivery.

Finished Iron and Steel.—The leading sellers of Structural Material report the receipt of numerous orders for small jobs and also for light stuff, largely from the country. For Bars specifications are coming in freely, notwithstanding the advance of $1. There is a good demand for Track Material, especially for Spikes. The demand for Light Rails is normal and specifications against existing contracts are steadily being furnished.

Old Material.—The demand for Scrap Iron and Steel is marked by unevenness so far as consumers are concerned, but the interest of dealers for the offerings of the railroads has been sufficiently keen to maintain prices, in spite of the fact that Scrap Iron is relatively higher than Pig Iron.

Relaying Rails are very scarce and wanted at an advance on last week's price. Cast Scrap is still ruling dull. There are no railroad lists out. We quote as follows per gross ton, f.o.b. St. Louis:

Old Iron Rails	$16.50 to $17.00
Old Steel Rails, rerolling	15.50 to 16.00
Old Steel Rails, less than 3 ft	14.25 to 14.75
Relaying Rails, standard sections, subject to inspection	23.00 to 24.00
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel Scrap	13.50 to 14.00
Frogs, Switches and Guards, cut apart	13.50 to 14.00
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$15.00 to $15.50
Iron Car Axles	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Dealers' Forge	11.50 to 12.00
Mixed Borings, &c	5.50 to 6.00
Machine Shop Turnings	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings	9.50 to 10.00
No. 1 Cast Scrap	12.00 to 12.50
Railroad Malleable	11.00 to 11.50
Agricultural Malleable	10.00 to 10.50
Pipes and Flues	8.75 to 9.50

Lead, Spelter, &c.—There is a limited demand for Lead at 4.35c., St. Louis. Lead Ore is lower and offered at $26.25, f.o.b. Joplin, for best grades. The tone of the market for Spelter is firm, as the Brass trade is buying more freely. The price range is 4.70c. to 4.80c., St. Louis. Zinc Ore is in good demand, at $37 to $38, Joplin basis.

The St. Louis Car Company has been able to keep its plant open, though the run of business is light. The automobile shop is busy building cars on the 1909 model, and finds the demand somewhat improved.

The Stupp Brothers' Bridge & Iron Company has not been obliged to shut down or reduce its working force.

The Union Iron & Foundry Company states that the demand for Iron work for store fronts has improved this fall, and while below the corresponding time last year, the outlook is favorable for a gradual increase. Prices, however, owing to competition, are somewhat unsatisfactory.

The St. Louis Architectural Iron Company finds a moderate but steady demand for store fronts, and is running three heats each week for castings.

The Broderick & Bascomb Rope Company states that the demand for wire rope is now larger, and the outlook has grown brighter since September 1.

Fisher & Davis have been running full time the past month, turning out saw mill machinery. This was the only month the present year which has required it.

The Block-Pollack Company is removing its offices to suite 1317 Missouri Trust Building. Harry Benjamin, local assistant treasurer, is in charge of the St. Louis business.

The St. Louis Blast Furnace Company has sold its output of Basic Iron up to January 1, 1909.

Pittsburgh.

PARK BUILDING, October 7, 1908.—(*By Telegraph.*)

Pig Iron.—The market continues quiet, the only inquiry of note being that of the United States Company, at Canton, Ohio, for 12,000 tons of Basic, at the rate of 2000 tons a month for the first six months of next year. It is hardly likely that the furnaces will quote on this inquiry on the basis of to-day's prices, but as there is a good deal of pressure to sell Basic Iron because the output is heavy, it is possible that the purchase may be made at the present ruling rate. We note a sale of 2500 tons of Basic for last quarter, and the same quantity for first quarter of next year at $14.25, Valley furnace. There is little inquiry for Bessemer or Malleable Bessemer, only an occasional carload lot being sold. Foundry Iron is also very quiet, and there has been nothing done in Forge Iron in this market for some time. We quote Standard Bessemer Iron at $15; Basic, $14.25; Malleable Bessemer, $14.50; No. 2 Foundry, $14.35 to $14.50, and Forge at $13.50, all at Valley furnace. The freight to Pittsburgh is 90c. a ton. The Shenango Furnace Company started up its No. 4 Furnace on September 28, and is now running Nos. 1, 3 and 4 on Basic, making about 900 tons a day.

Steel.—New sales are light, but consumers with contracts are taking out a little more Steel in the shape of Soft Billets and Forging Billets. Shipments against contracts on Sheet and Tin Bars have fallen off very much, as these two trades are extremely dull at present. We quote Bessemer and Open Hearth Billets, 3⅞ in. and larger, up to and including 0.25 carbon, $25; 0.26 to 0.60 carbon, $1 extra; over 0.60 carbon, $2 extras, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight, or 50c. additional, is charged. Sheet and Tin Bars in random lengths are $27, f.o.b. Pittsburgh. Forging Billets take $2 advance over Rolling Billets.

(*By Mail.*)

As we get closer to the Presidential election the tendency to defer buying until after that event has taken place seems to be getting stronger. The whole trade seems to have settled down to the conviction that business will be very quiet for a month or so at least, while the impression is pretty general that no heavy business in the Steel trade can reasonably be expected before next spring. Were it not that specifications on contracts on some lines are coming in pretty freely, the situation would be about as dull as at any time in the past year. Little is doing in Pig Iron, and while there is some inquiry for next year, it is regarded more as a feeler to find out what the furnaces would quote, as nothing further is usually heard from the prospective buyers. About the only line that is holding up is Pipe, this trade showing a gradual increase each month over the previous one. The Coke and Scrap trades continue quiet, but in spite of a lack of orders from consumers for Old Material that market is firm.

Ferromanganese.—While sales are limited, there is a strong belief that prices have touched bottom and that the market may be higher toward the close of the year. We quote 80 per cent. foreign at $42.50 to $43, seaboard, for prompt shipment, the rate to Pittsburgh being $1.95 a ton. For future delivery from $1 to $2 more is asked.

Ferrosilicon.—We note a sale of 25 tons to a local consumer at about $67, and quote the market at $67 to $67.50, Pittsburgh, for 50 per cent.

Muck Bar.—In the absence of new orders we quote best grades, made from all Pig Iron, at nominally $25, Pittsburgh. Northern Forge Iron can be laid down at $14.40, Pittsburgh, or lower, but it is claimed that even with this low price there is no money to a mill in making Muck Bar at $25 a ton.

Wire Rods.—We do not hear of any new orders for Wire Rods, but consumers, notably the Chain manufacturers, are specifying liberally against contracts and shipments by the mills are fairly heavy. A leading producer of Rods, not in the market for some time as a seller, may soon be seeking business from the outside trade. We quote Bessemer Rods at $33, Chain Rods $33 and Basic $34, Pittsburgh.

Skelp.—The market is quiet, no new orders for Skelp having been placed here for some time. Prices are nominally as follows: Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Plates.—It now develops that the report that the Pitt Iron Mining Company, owned by the La Belle Iron Works, Steubenville, Ohio, has placed an order with the American Shipbuilding Company for an Ore boat is premature. This company has been considering for some time the matter of building an Ore boat, but has not come to a final decision. The general demand for Plates is light, being still confined to small lots for actual needs. Hardly enough new orders are coming out to test prices, but there is still some cutting being done, probably not over $2 a ton in extreme cases. Regular prices are as follows: Tank Plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.60c., base, at mills, Pittsburgh. Extras over this price as are follows:

Tank, Ship and Bridge quality, ¼ in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. Plate. Steel Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel Plates over 72 in. wide ordered less than 11 in. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on Plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Locomotive Firebox Steel	.50
Shell grade of Steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.50c., f.o.b. Pittsburgh.

Steel Rails.—The railroads are still out of the market, only an occasional small order being placed. The demand for Light Rails is fairly active, the Carnegie Steel Company having taken about 1500 tons in the past week. Nos. 2 and 3 Rail mills at the Edgar Thomson plant are running to about 35 per cent. of capacity, but No. 1 mill is idle. Prices on new Light Rails, which are sometimes shaded from $1 to $2 a ton for rerolled Rails, are as follows: $25 for 25 to 45 lb. Sections, with $1 advance for 20 lb., $2 advance for 16-lb.,

and $3 advance for 12-lb. Standard Sections are $28, at mill, and Angle Splice Bars, 1.65c., at mill.

Structural Material.—No large work is in sight. The American Bridge Company booked about 15,000 tons in September, which is only about 25 per cent. of its capacity. The contract for the Steel bridge over the Monongahela River, on which the Fort Pitt Bridge Works was the lowest bidder, has not been placed, and it is intimated that some complications may make necessary the asking of new bids. No inquiries have yet come out for the addition to Joseph Horne & Co.'s store, which under present plans will require about 1500 tons. There is still much complaint of the low prices ruling for fabricated work. We quote for mill shipment, f.o.b. Pittsburgh, as follows: I-Beams, H-Beams, and Channels, 3 to 15 in., inclusive, 1.60c., net; Beams over 15 in., 1.70c., net; Angles, 3 to 6 in., inclusive, ¼-in. and up, 1.60c., net; Angles, over 6 in., 1.70c. net; Angles 3 x 3 in. and up, less than ¼ in., 1.50c., base, half extras, Steel Bar card; Tees, 3 in. and up 1.65c. net; Zees, 3 in. and up, 1.60c., net; Angles, Channels, and Tees under 3 in., 1.50c., base, half extras, Steel Bars card; Deck Beams and Bulb Angles, 1.90c., net; Hand Rail Tees, 3c., net; Checkered and Corrugated Plates, 3c., net.

Sheets.—The Sheet trade is in very unsatisfactory condition, both as regards demand and prices. Consumers are buying sparingly, placing only small orders for actual needs, and the amount of new business being booked by the mills is relatively small. Prices are being shaded, but in most cases not over $2 a ton. For shipment from mill, regular prices, which are shaded by some mills from $1 to $2 a ton, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c.; No. 28, Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The Tin Plate trade was a little more active last week, specifications coming in for a fairly large tonnage, which, to some extent, was unexpected. The Sabraton plant of the American Sheet & Tin Plate Company, at Morgantown, W. Va., started up October 5, after being shut down about three weeks, but this has been offset by the closing down of other capacity. It is estimated that only 35 to 40 per cent. of Tin Plate capacity is active at present. Prices continue to be shaded on any desirable business coming up. The regular price of Tin Plate is $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Reports that the Carnegie Steel Company would build a number of new Hoop mills in the Youngstown District are officially denied. New orders for Hoops and Bands are light and represent only actual needs, but shipments on contracts placed early in the year are fairly heavy. Regular prices on Hoops and Bands, which, it is stated, are being maintained, are as follows: Steel Hoops, 1.80c., base, full Hoop card prices; Steel Bands, 1.40c., base, half Steel card extra, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Bars.—New orders for Steel Bars are light, being only for small lots for actual needs. However, specifications against the heavy contracts placed by the implement makers and other large consumers last June are coming in quite freely, one leading Steel Bar interest advising us that it is operating to about 85 per cent. of capacity. It is stated that stocks being carried by the large trade are very low, and this is borne out by the fact that even on the small orders now being placed requests for prompt shipment are usually made. The mills rolling Steel Bars are operating to larger capacity than they were two or three months ago. In Iron Bars the situation is quiet, only small orders being placed, which makes it difficult for the mills to make up satisfactory rolling schedules. Most of the Bar Iron mills are operating spasmodically, running full one week to clean up orders, and then shutting down until enough business accumulates to warrant starting up again. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Merchant Steel.—Specifications against contracts are fairly satisfactory, but new orders for seasonable Steels, such as Sleigh Shoe, Toe Calk, and Tire, are light, and for actual needs of consumers. Specifications against contracts for Shafting are coming in quite freely, and several of the leading makers advise us they have a good deal of tonnage booked for future delivery. Prices on Shafting continue to be slightly shaded on any desirable orders. We quote Cold Rolled Shafting at 57 per cent. off in carloads, and 52 per cent. on less than carloads, delivered in base territory. Prices on Merchant Steel are being shaded, regular quotations being as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher prices being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron finish, 1½ x ½ in. and heavier, 1.40c.; under 1½ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b. at mill.

Merchant Pipe.—September showed a very slight increase in orders over August, but the Pipe trade seems to be in more satisfactory condition than any of the other finished lines. The mills are able to operate to about 60 per cent. of capacity, and the general demand is fairly active, but as yet there is not much tendency on the part of the large trade to buy beyond actual needs. The National Tube Company is now making shipments on a large gas line which the Columbia Gas & Electric Company is building from the West Virginia gas fields into Cincinnati. Prices on Iron Pipe continue to be shaded more or less, but we are advised that the Steel Pipe mills are rigidly adhering to regular prices. Discounts on Steel Pipe, ¾ to 6 in., to the large trade, are 76 and 5 per cent. off list. Regular discounts are as follows:

Merchant Pipe.

	Jobbers, carloads, Steel. Black.	Galv.
	%	%
⅛ to ¼ in	67	51
⅜ in	69	55
½ in	71	59
¾ to 6 in	75	65
7 to 12 in	72	57
Extra strong, plain ends:		
⅛ to ⅜ in	60	48
½ to 4 in	67	55
4½ to 8 in	63	51
Double extra strong, plain ends:		
½ to 8 in	56	45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ to ¼ in	65	..
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Boiler Tubes.—The railroads are buying a few Tubes for repair work, but are not placing any orders for new work. The demand for Merchant Tubes is also very dull, and there is more or less cutting going on. For Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Spelter.—A little more inquiry is reported, and the tone of the market is firmer. There has been a heavy curtailment in the output of Spelter by the smelters, and to this is attributed the firmer market as the demand is small, most of the galvanizing plants not running to 50 per cent. of capacity, if that much. We quote prime grades of Western Spelter at 4.60c. to 4.65c., East St. Louis, to which should be added a freight rate of 12½c. for Pittsburgh delivery.

Railroad Spikes.—The railroads are sending in only a few small orders for repair work. The demand for the smaller sizes is active, and several makers advise us they have enough orders booked to keep them busy for the next six to eight weeks. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Iron and Steel Scrap.—The market is quiet, but prices are firm, and there is a feeling on the part of dealers that Scrap will bring higher figures before long. This may be the case, but at the same time two or three leading consumers of Scrap, in preference to paying $15 a ton for Heavy Steel, are now using Pig Iron, which they can buy at about the same price and which serves their purposes better. It is also true that most consumers of Scrap have pretty heavy stocks on hand, and a waiting game seems to be on between consumers and dealers, with the result that not much is doing in the way of making sales. Prices are firm, dealers quoting about as follows per gross ton: Heavy Steel Scrap for Pittsburgh, Sharon, Follansbee, Monessen and Steubenville delivery, $15 to $15.25, while Heavy Steel Scrap

for hand charged Open Hearth furnaces, pieces weighing 10 lb. minimum to 300 lb. maximum, is 75c. to $1 a ton higher; Cast Iron Borings, $9 to $9.25; Bundled Sheet Scrap, $12.25 to $12.50; No. 1 Railroad Wrought Scrap, $16.50 to $16.75; No. 1 Busheling Scrap, $13.75 to $14; No. 2, $10.25 to $10.50; No. 1 Cast Scrap, $14.50 to $14.75; Sheet Bar Crop Ends, $17.50 to $18; Iron Axles, $22.50 to $23; Low Phosphorus Melting Stock, 0.035 and under in phosphorus, $19; Rerolling Rails, $16 to $16.25; Steel Axles, $19 to $19.25; Machine Shop Turnings, $9.75 to $10; Grate Bars, $12.25 to $12.50; Old Car Wheels, $15 to $15.50; Railroad Malleable, $14 to $14.25.

Coke.—There is no improvement in the Coke trade, either as regards demand or prices. This is the season of the year when the furnaces and foundries usually commence to look around for their supply of Coke for the next year, but so far little of this has been done. Strictly Connellsville Furnace Coke for prompt shipment can still be had at $1.50 a ton at oven or less, while on Coke for first half of next year delivery, $1.75 to $1.85 seem to be the ideas of the Coke makers, but these prices do not appear to interest furnace men. Connellsville 72-hr. Foundry Coke is $2 to $2.25, at oven, but there is very little inquiry. Only about 40 per cent. of the ovens in the Upper and Lower Connellsville region are in operation, and a shortage in water supply is still interfering seriously with operations at practically all of the plants.

Cincinnati.

CINCINNATI, OHIO, October 7, 1908.—(*By Telegraph.*)

It is very quiet in the Iron and machinery and machine tool markets, a disposition seeming manifest to delay orders of all kinds save those absolutely required for current needs. Some tool manufacturers evidence confidence in the future, as shown in renewal of contracts and placing of good-sized orders for Castings. Prices on machinery are being well maintained, although persistent rumors of cutting on some lines of finished material and reductions on a few items of Scrap are to be noted this week. A break of 50c. to 75c. a ton on Heavy Melting Steel is the most noticeable feature in Old Material markets. October opens fairly well with the large tool manufacturing concerns, and some of these contemplate an early increase in working forces and time.

Pig Iron.—Few inquiries are to be noted this week, although there is a strong disposition to feel the market for the first quarter and half deliveries. There seems to be some sharp competition on between the Southern Ohio and Valley furnaces on Malleable, Basic and Foundry business. Recent inquiries have been from a territory in which these Irons have a big advantage over the Southern product in the matter of freights. Reports from Ironton indicate that but two furnaces are now in blast in the Hanging Rock region. The best price heard to-day on Southern No. 2 Foundry is $12.50, Birmingham, and most Alabama furnaces are out of the market altogether or are holding for the prohibitive price of $13. For the first quarter $13 is the best price heard, and on Northern Irons $15. Jisco, the New Jackson County furnace, went into blast Monday on High Silicon Iron. Ohio Silveries are still quotable at $18.50, at furnace. Some business has been placed with Southern Ohio furnaces at around $14.75 for prompt shipment on No. 2. The inquiry for Malleable mentioned last week is said to have been satisfied with some Valley or Columbus Iron at a price of something better than $14.50, at furnace. The north central Ohio melter who was asking for 500 tons of Basic is out with another inquiry of the same amount and for prompt shipment. The business is expected to go to Cleveland or Toledo. An inquiry from a northern Illinois melter is for 200 to 300 tons of Foundry Iron. An Ohio stove maker is asking for 300 tons of Foundry Iron for prompt shipment, and this is construed to mean a considerably larger order if the price is attractive. Persistent rumors of a 20,000-ton sale of a new southern Ohio Iron to the largest Pipe maker are denied by the interested parties. For prompt delivery and balance of the year we quote, f.o.b. Cincinnati, the freight rate being $3.25 from Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	15.00 to 15.50
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.45 to 16.95
Lake Superior Coke, No. 2	15.95 to 16.45
Lake Superior Coke, No. 3	15.45 to 15.95
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	21.75 to 22.25

(*By Mail.*)

Coke.—Practically no new business is coming out, although consumers are taking shipments promptly and no change is to be noted in prices. Aside from the contracts which carry shipments into next year, as far as the first half, no inquiries are heard for next year's prices. Virginia Furnace brands are quotable at $1.75 to $1.85, at oven; Foundry, $2.10 to $2.25; Connellsville Furnace grades, $1.65 to $1.85 for nearby shipment, some producers asking for the same grades $2.50 for the first half; Foundry, $2.25 to $2.40; Pocahontas, listless, at about $1.65 to $1.75, and Foundry grades about $2 to $2.25. In some districts the prolonged drouth has undoubtedly affected production, but it is reported here that some additional ovens are being lighted in the Connellsville region.

Finished Material.—Dealers' prices are well maintained, but there are rumors of cutting on large lots charged to the independents. Bolts are particularly noticeable in this connection. Because of the higher prices of Scrap, there is talk of an advance on Iron Bars from 1.35c., Pittsburgh, to 1.40c., and on some new business these prices are now being asked. Most dealers in this section note a falling off in business, especially marked the past two weeks. Business for the year is expected to average no more than 65 to 70 per cent. of normal. Dealers are quoting to the trade as follows, f.o.b. Cincinnati: Iron Bars, carload lots, 1.55c., base, with half extras; small lots from store, 1.85c., base, half extras; Steel Plates, carload lots, 1.75c., base, with half extras; small lots from store, 1.85c., base, half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c.; Blue Annealed Sheets, heavy, No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; No. 12, carload lots, 2c.; small lots from store, 2.30c.; Sheets (Light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Steel Tire, 4-in. and heavier, carload lots, 1.95c.; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—It is still a dealers' market, but they are weakening a little in their independent attitude, so that on some lines such as Heavy Melting Steel last week's prices could be shaded as much as 50c. to 75c. per ton. Select Railroad Wrought is still firm. Everything is practically at a standstill until after election. Dealers here are quoting as follows, f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton	$12.50 to $13.50
Cast Borings, net ton	5.00 to 5.50
Heavy Melting Steel Scrap, gross ton	13.50 to 14.50
Steel Turnings, net ton	6.00 to 7.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast, net ton	9.00 to 10.00
Old Iron Axles, net ton	16.50 to 17.50
Old Iron Rails, gross ton	15.00 to 16.00
Old Steel Rails, short, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	12.50 to 13.50
Relaying Rails, 56 lb. and up, gross ton	20.00 to 21.00
Old Car Wheels, gross ton	13.00 to 14.00
Low Phosphorus Scrap, gross ton	14.00 to 15.00

Birmingham.

BIRMINGHAM, ALA., October 5, 1908.

Pig Iron.—The market is very quiet, with all parties concerned apparently content to await developments believed to be imminent. Melters generally urge the delivery of Iron engaged, and in some lines of foundry trades recent improvement has necessitated additional purchases of raw material, but in the majority of such cases proportions of engagements have been increased only to the extent warranted by actual requirements. The most encouraging reports as to the melt comes from the manufacturers of Cast Iron Pipe, a contract for some 15,000 tons having recently been placed in this district. Producers offer no inducement for more extensive negotiations in the shape of concessions in prices, the $13 Birmingham schedule being firmly adhered to. Especially is this true of first quarter deliveries. A number of requests have been made for quotations on tonnage to cover the first half of 1909, but no quotations applicable to deliveries beyond the first quarter have been elicited. The condition of producers' order books is further evinced by the fact that the rate of production is to be increased by two additional stacks within the coming week instead of only one, as previously stated. This addition is for order-book requirements, although a third stack will go in blast within 10 days, the output of which will probably represent a surplus. The largest consideration among transactions during the past week was 1000 tons for the remainder of the year. This sale is reported on a basis of $13, Birmingham, for No. 2, and a number of smaller lots have brought the same figures. The demand was of a rather desultory nature, however, and the aggregate of engagements resulting is comparatively small. An inquiry from a stove manufacturer is the only prospect for business during the coming week.

Cast Iron Pipe.—The transactions recorded the past week have involved comparatively small lots, but to the list of lettings in sight the following are added: 900 tons of Water Pipe for the city of Hope, Ark., upon which bids will be received October 5. The city of Linden, N. J., is to receive bids on 1000 tons of Water Pipe October 7, and approximately 4000 tons of 4 to 24 in. Water Pipe is to be placed at an early date for Long Beach, N. Y. Quotations of Southern producers have been materially strengthened by reason

of the fact that the contract recently placed for Cuba is to be furnished by a Southern plant. By this arrangement the output of one of the largest plants in this district will be practically taken off the market for two or three months. We quote the market as firm at the following prices for Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., $24; 8 to 12 in., $23; over 12 in., average $22, with $1 per ton extra for Gas Pipe.

Old Material.—There has been no improvement in this market since last report. Recent inquiries have in but few cases resulted in sales, and reports relative to mills now idle are not indicative of an early increase in the consumption. Dealers adhere firmly to quotations and are gradually increasing their stocks. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$14.50 to $15.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	13.00 to 13.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	11.00 to 11.50
No. 1 Machinery	11.00 to 11.50
No. 1 Steel	9.50 to 10.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	5.00 to 5.50

Philadelphia.

PHILADELPHIA, PA., October 6, 1908.

Business has been interrupted to a considerable extent by the celebration of the 225th anniversary of the founding of the city of Philadelphia. The exercises will continue throughout the week. There is also a strong tendency to defer action on important matters until after election, and a large volume of business is, therefore, held in abeyance. The Pig Iron markets have been particularly quiet. Finished materials have been in about even demand, with a slightly better feeling shown in some lines. Old Material has been moving somewhat more freely, particularly Heavy Melting Steel; the other specialties are still inactive. The outlook for business in the near future is problematical, and unless something unexpected develops the month, it is believed, will be a quiet one. After the November election a more active buying movement in practically all branches of the trade is anticipated.

Pig Iron.—Current business has been comparatively light. The bulk of the sales made during the week have been confined to the Foundry grades. A waiting policy appears to have been pretty generally adopted by consumers, and in the majority of cases orders placed have been for small lots to cover immediate requirements or partial needs during the balance of the year. There has been considerable feeling of the market for Iron for delivery in the first quarter and half of next year, but few sellers are willing to contract for extended forward delivery. Quite a number still withhold quotations for any delivery in 1909. Sellers in eastern Pennsylvania have the situation pretty well in hand. Prices are being strongly maintained. While some interests have sold practically all their output of certain grades for the balance of the year, they are not inclined to increase their present curtailed capacity, the policy being to produce no greater tonnage than the market will absorb, thereby maintaining business as well as prices on a comparatively even basis. A large volume of business is being held up awaiting the outcome of the November election, and both buyers and sellers will, no doubt, conduct their business along conservative lines until then. For the standard grades of eastern Pennsylvania Foundry Iron prices are unchanged, but, if anything, are firmer. No. 2 X Foundry is quoted at $16.75 to $17, delivered in buyers' yards, but more business, particularly in small lots, is being done at the higher rather than at the lower level. Several large producers still express their willingness to sell freely at $16.75 for delivery over the balance of the year. Sales of the higher grades of Foundry Iron have been confined to small lots, but even these orders come out irregularly. Low grade Foundry Irons have been a shade more active, and sales of several lots of 100 and 500 tons for delivery over the balance of the year have been made at $15.50 to $15.65, delivered. The Pipe foundries are still in the market for several round lots of Iron, for which it is understood that a willingness to pay $15.25 has been expressed, but sellers refuse, as a rule, to consider those figures. This grade of Iron is not plentiful, and a number of producers have sold about all they have at the time or are likely to make for shipment this year. Southern Irons have been quiet, but little business having been transacted recently. Virginia Foundry Irons have been sold in small spot lots for prompt shipment at full prices. Few sellers of Virginia Irons are inclined to take business for delivery beyond 30 or 60 days at the ruling price level. There has been a somewhat less demand for Forge Iron, but makers are pretty well sold up on this grade and prices are strong. No large tonnages were sold during the week, some small sales being reported at $15.50 to $15.75, delivered. The Steel making Irons have been rather quiet. Few melters are in the market for Basic for shipment the balance of the year, while others are not yet prepared to enter their orders for next year's delivery. The majority of sellers are holding firmly at $16 for Basic for shipment in the next six months, although it is understood that this price might be shaded 50c. a ton if a desirable tonnage came out for delivery for the balance of the year. Low Phosphorus Iron is dull and uncalled for, and prices on this grade are not particularly strong. The situation on the whole is hardly as bright as it was, but this is believed to be but temporary. Prices, however, are decidedly firm, and it is believed that a good volume of business will come out later in the year. For delivery in buyers' yards, eastern Pennsylvania and nearby territory, the following prices for delivery during the remainder of the year are quoted:

Eastern Pennsylvania, No. 2 X Foundry	$16.75 to $17.00
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.50
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.75
Gray Forge	15.50 to 15.75
Basic	15.50 to 16.00
Low Phosphorus	20.00 to 20.50

Ferromanganese.—Only a few small inquiries have developed. Quotations still show variation. $44.50 to $45, Baltimore, is named by some sellers for forward Ferro, but it is understood that $43.75 has been shaded for a small lot for early shipment.

Plates.—A fairly good day to day demand is reported by manufacturers. Business closed continues about on an even basis, but is usually in small lots, and of a miscellaneous character. Some good propositions are pending, but they develop slowly. For delivery in this territory prices are unchanged, as follows:

	Carloads. Cents.	Parts carload. Cents.
Tank, Bridge and Boat Steel	1.75	1.80
Flange or Boiler Steel	1.85	1.95
Commercial Firebox	1.95	2.00
Marine	2.15	2.20
Locomotive Firebox Steel	2.25	2.30

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Steel Billets.—The demand for ordinary Rolling Steel continues quiet. A better demand has developed for Forging Steel, and a fairly good volume of business has been done in small lots. Mills are able to maintain their current rate of production, and the outlook is considered somewhat more favorable. For delivery in this territory quotations are firm, and unchanged, $26.20 being named for ordinary Rolling Steel, and $28.20 for Forging Steel, subject to the usual extras for high carbons and special sizes.

Structural Material.—Business continues along narrow lines, the bulk of the orders placed having been small. No propositions of any importance were closed during the week. The outlook is somewhat more favorable and more active conditions, particularly in the building trades, are looked forward to. It has about been decided that the new bridge to be erected over the Schuylkill River at Passyunk avenue by the city is to be of the bascule type. Plans for this are now being drawn. Prices are firm and quotations for delivery in this territory range from 1.75c. to 1.90c. ,according to specifications.

Sheets.—The demand for Sheets continues comparatively good. Orders are usually small and for prompt shipment, but the number received enables mills to operate at from 75 per cent. to full capacity. Prices for mill shipment range as follows, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—An irregular demand continues and the market shows practically no change. Buying has been spotty and mostly in small lots for prompt shipment. Prices are unchanged, 1.45c. to 1.50c. being quoted for delivery in this territory. Steel Bars are quoted at 1.55c., but are not very active, with Rerolled Bars at 1.50c., delivered.

Coke.—Business has been somewhat more active, but the orders taken have not been large. The blowing in of increased blast furnace capacity in this territory will increase the consumption of Furnace Coke, while Foundry Coke is in better demand from the smaller foundries. Prices are unchanged but stronger, Foundry Coke being quoted at $2 to $2.25 at oven, with Furnace Coke at $1.50 to $1.75. For deliveries in this territory the following range of prices is named:

Connellsville Furnace Coke	$3.65 to $3.90
Foundry Coke	4.15 to 4.40
Mountain Furnace Coke	3.25 to 3.50
Foundry Coke	3.75 to 4.00

Old Material.—Considerable activity has developed during the week, particularly in Heavy Melting Steel, sales aggregating about 14,000 tons for delivery over the remainder of the year having been made at prices ranging from $15 to

$15.50, the bulk of the business being at the inside figure. One concern took a number of miscellaneous lots, including No. 1 Heavy Melting stock and Rails, long and short lengths, aggregating nearly 7000 tons, for none of which over $15, delivered, was paid. Rolling mill Scrap has not been very active, but prices have been maintained except in the case of Borings, which are about 25c. under last week's quotations. The market, on the whole, is not very active. Prices are nominally unchanged, and range about as follows for delivery in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops	$15.00 to $15.50
Low Phosphorus	18.50 to 19.00
Old Steel Axles	21.50 to 22.00
Old Iron Axles	22.50 to 23.00
Old Iron Rails	20.50 to 21.00
Old Car Wheels	15.00 to 15.50
Choice No. 1 R. R. Wrought	18.25 to 18.75
Machinery Cast	15.25 to 15.75
Railroad Malleable	13.50 to 14.00
Wrought Iron Pipe	14.25 to 14.75
New Bundled Sheets	13.50 to 14.00
No. 1 Forge Fire Scrap	12.00 to 12.50
No. 2 Light Iron	8.75 to 9.25
Wrought Turnings	11.50 to 12.00
Stove Plate	13.00 to 13.50
Cast Borings	11.00 to 11.50
Grate Bars	13.50 to 14.00

Buffalo.

BUFFALO, N. Y., October 6, 1908.

Pig Iron.—The market is quiet, with placements of new business confined principally to immediate requirements. The tendency so far as future deliveries are concerned is to hold back both on inquiries and quotations until after election. A good volume of specifications against existing contracts continues. Some furnaces, being sold up to full capacity for this year's output, stand firmly for maximum prices; others not so fully booked, continue to take orders at the same level of prices as for the past month or six weeks. All look forward to an improvement and more settled conditions after election. Commencing with this week, these reports will include Basic Iron quotations, due to the starting up of the Wickwire Steel Company's furnace, which, in addition to making Basic Iron for the home plant of the Wickwire Brothers at Cortland, N. Y., will produce Basic Iron for the Buffalo market. None of the other furnaces in this district are equipped to make machine cast Iron. We quote as follows, f.o.b. Buffalo:

No. 1 X Foundry	$15.75 to $16.50
No. 2 X Foundry	15.25 to 16.00
No. 2 Plain	14.75 to 15.50
No. 3 Foundry	14.75 to 15.25
Gray Forge	14.50 to 15.00
Basic	15.00
Malleable Bessemer	16.00 to 17.00
Charcoal	20.00 to 20.50

Finished Iron and Steel.—A fair volume of new business in Bars, Shapes and Structural Material continues to come in small lots. More interest is being shown recently for Rails for electric line projects for New York State lines, from which business may possibly develop this fall. Specifications for the wholesale building to be erected for the Sinclair-Rooney Company, Buffalo, have been revised, and new bids called for this week on requirements of about 300 tons of Structural Material. Orders will also be placed this week for a small tonnage for an addition to the plant of the Jacob Dold Packing Company.

Old Material.—The market continues dull and apathetic, dealers not being willing to make concessions and consumers not inclined to purchase to any considerable extent at prices at which material is held. We quote the following prices, per gross ton, f.o.b. Buffalo:

Heavy Melting Steel Scrap	$14.00 to $14.25
No. 1 Railroad Wrought	15.00 to 15.25
No. 1 Railroad and Machinery Cast Scrap	14.00 to 14.50
Old Steel Axles	17.00 to 17.50
Old Iron Axles	20.00 to 20.50
Old Car Wheels	15.00 to 15.50
Railroad Malleable	13.00 to 13.50
Boiler Plate	12.00 to 12.50
Locomotive Grate Bars	11.50 to 12.00
Pipe	11.50 to 12.00
Wrought Iron and Soft Steel Turnings	8.00 to 8.25
Clean Cast Iron Borings	6.50 to 7.00
No. 1 Busheling Scrap	12.50 to 13.00

In the article, "Castings Versus Forgings," by James H. Baker, which appeared in *The Iron Age* of October 1, the author's meaning was changed by the omission of a qualifying expression. Instead of saying that "a stove is an impossibility in wrought iron," the writer's reference was to a particular type of gas stove, which by reason of its intricate design would not be a commercial possibility in wrought material, "and even if so made would not stand the heat like cast iron."

Cleveland.

CLEVELAND, OHIO, October 6, 1908.

Iron Ore.—Shipments from the upper lake ports in the month of September were 4,646,024 tons, a falling off of 103,631 tons as compared with August. The total movement to October 1 was 16,630,960 tons. This is a loss of 13,928,246 tons, as compared with the movement to October 1 a year ago, when the shipments for the season had reached 30,559,206 tons. September shows a loss of 1,571,629 tons, compared with the corresponding month last year. The Steel Corporation will keep up shipments pretty well for the balance of the season, but the Merchant Ore firms are getting fairly well cleaned up on contracts, and it is expected that October will show considerable falling off as compared with September, and that the November movement will be very light. At the close of navigation last year it was estimated that there were 7,385,728 tons of Ore on the docks. As the docks were crowded at the time the quantity will not be much larger on December 1 this year, although it will probably be a little larger owing to some increase in the dock space. There will be more Ore on the furnace yards, however, than at the close of navigation last year. The market is very quiet. The sale of a few small lots is reported, but inquiries are scarce and Ore firms expect to sell only a small tonnage during the balance of the season. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range Non-Bessemer, $3.70; Mesaba Non-Bessemer, $3.50.

Pig Iron.—The local Foundry Iron market is very dull and little, if any, improvement is looked for until after election. Sales for consumption in this territory during the week were limited to a few small lots. Consumers are well covered for the balance of the year. Their purchases have not been greater than their needs in most cases, so that shipments on contracts are not being held up and a few are asking that shipments be anticipated. Only a small tonnage has been sold for next year's delivery, and little buying on that account is expected until the result of the election is known. Prices remain stationary, but the market continues weak. While No. 2 Foundry is still quoted at $14.50, Valley furnace, that price is the top of the market, and it is being shaded to about $14.25. Local furnaces continue to quote No. 2 Foundry at $15, at furnace, shading this price for outside shipments. For first half delivery furnaces are asking $14.50 to $15 for No. 2 Foundry, local furnaces refusing to quote under the latter price. The market is somewhat more active outside of this territory, and a local interest sold during the week 2200 tons, nearly all of which went to Indiana foundry concerns. Included in these sales were one lot of 800 tons of Foundry Iron and an 800-ton lot of half Foundry and half Malleable. A portion of the deliveries will extend over the first quarter. The sales were made at from $15 to $15.25, Toledo, small lots bringing the latter price. The Basic inquiries that were noted last week resulted in the sale by a local interest of a considerable tonnage for the balance of the year delivery at $14.25, Valley furnace. A lot of 2000 tons of Bessemer Iron is being offered for resale at a low price. The only Bessemer inquiry in the market is one for 300 tons. For prompt shipment and for the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90 to $16.40
Northern Foundry, No. 1	15.50 to 15.80
Northern Foundry, No. 2	15.25 to 15.50
Northern Foundry, No. 3	14.90 to 15.25
Southern Foundry, No. 2	16.85 to 17.35
Jackson County Silvery, 8 per cent. Silicon	20.05
Gray Forge	14.25 to 14.50

Coke.—There is practically no demand for either grade and prices remain stationary. For prompt shipment Standard Connellsville Furnace Coke is being offered at $1.50 to $1.60, at oven, and about the latter price for the balance of the year. Consumers of Foundry Coke are covered for the balance of the year, and are not yet ready to buy for next year. We quote 72-hr. Connellsville Foundry Coke at $2 to $2.25, at oven, for balance of the year, and $2.25 for the first half.

Finished Iron and Steel.—Very little new business is being placed, and specifications on contracts show a falling off in aggregate tonnage, as compared with September. Some of the mill agents report that the number of their orders are as numerous as they were, but they are for smaller lots of material. Not a great deal of new business is expected until after election. The demand for Steel Bars is holding up better than for other lines. There is a falling off in the demand for Structural Material, although some good orders have come from bridge companies that have considerable county and municipal work on hand. As the end of the building season is near at hand, there is less demand for Structural Material for small work, and fabricators are not as busy as they were a month ago. The falling off in the demand appears more noticeable in Plates than in other lines. The limited number of inquiries for car lots of Plates causes unusually lively competition among the mills for the business. The demand for Iron Bars is light, and local mills are running only at part of their capacity. Fol-

lowing the placing of orders for two lake freight boats with the American Shipbuilding Company, mention of which was made last week, that company has closed a contract for 5000 tons of material, one-half Plates and one-half Structural Shapes and Bars, to be used in their construction. The only new Rail inquiry of any size pending is for 800 tons of Standard Sections, for an Eastern traction line. Some car lot orders for Light Rails are coming from coal mining companies, but they are mostly on contracts. Prices on Steel Bars are being maintained, and there is less shading of the price of Iron Bars than a few weeks ago. The smaller Sheet and Plate mills continue to cut prices from $1 to $2 per ton. The general situation among manufacturers continues to improve slowly, and these consumers of Finished Material are using more material, but many of them have fairly good stocks on hand, and are now ordering in smaller lots for immediate requirements. Jobbers report a slight falling off in orders, as compared with last month, but their September business was far ahead of August, and the latter month showed a good gain over any previous month of the year. We quote: Iron Bars, 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., base, Cleveland, and Plates, ¼ in. and heavier, 1.70c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels from warehouse are 2c., and Plates, ¼ in. and heavier, 1.90c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.: Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.80c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 71 per cent. discount.

Old Material.—Some demand is noted for Scrap in small lots for immediate needs, but consumers are not buying ahead and no large inquiries are out. Although the market is quiet prices remain firm, although there are reports of a slight weakening in the East. Little Scrap can be found for sale below the ruling quotations. The railroad offerings this month are light. This week's lists include about 1000 tons to be sold by the Pennsylvania and a small lot offered by the Wheeling & Lake Erie. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$14.00 to $14.50
Old Iron Rails	17.00 to 17.50
Steel Car Axles	19.00 to 19.50
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel	13.75 to 14.25
Relaying Rails, 50 lb. and over	22.00 to 23.00
Railroad Malleable	13.25 to 13.75
Agricultural Malleable	12.00 to 12.50
Light Bundled Sheet Scrap	9.50 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$20.00 to $20.50
Cast Borings	7.00 to 7.50
Iron and Steel Turnings and Drillings	8.00 to 8.50
Steel Axle Turnings	8.50 to 9.00
No. 1 Busheling	12.00 to 12.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.75 to 11.25
Bundled Tin Scrap	8.00 to 9.00

Metal Market.

NEW YORK, October 7, 1908.

Pig Tin.—The statistics of Pig Tin, as compiled by C. Mayer, were a disappointment to those who had expected returns favoring lower prices. It would have been more of a shock to the Tin trade in general had it not been known the day before that the shipments from the Straits for September were about 500 tons below the original estimates. The visible supply on September 30 was 18,109 tons. This figure has not been equaled since the end of March, 1903, when the visible supply was 19,497 tons. At that time the price of Tin was approximately the same as to-day. Stocks in the United States at the end of the month were 2159 tons. Business during the week has been dull and featureless. Price fluctuations have been within narrow limits, being quoted as follows for 5-ton lots of spot Tin, New York:

	Cents.
October 1	29.50
October 2	29.50
October 5	29.45
October 6	29.40
October 7	29.50

The arrivals so far this month are 400 tons, and there are afloat for American ports 1805 tons. The London market closes to-day at £134 5s. for spot and £135 15s. for futures.

Copper.—The exports of Copper during September were 19,378 tons. The total for the first nine months of the year amounts to 226,995 tons, against 127,775 tons in the same period of last year and 154,626 tons in the same period of 1906. This illustrates very forcibly the immense help Europe has been this year. At the same time imports are not unduly large, those for August, now for the first time reported, being 8000 tons, and the total for the first eight months of this year aggregating 53,700 tons, against 88,600 tons in the corresponding period last year. Domestic business continues apathetic, but prices are undoubtedly firmer as witnessed by the sale this week of a carload of Electrolytic at 13.55c., delivery 30 days. One of the leading sellers of Electrolytic maintains a nominal quotation of 13.75c. While resale lots can be had at 13.50c. cash, this only applies to resale lots and for cash. The Lake market is nominal, producers asking 14c., but it is possible that from second hands it may be obtained at 13.75c. The base price of Bare Copper Wire was reduced ½c. October 5 to 14.75c. The tendency on the part of both buyers and sellers continues to be a waiting one, depending on the political outcome. The European markets are falling slightly, and London closes to-day at £59 13s. 9d. for spot, and £60 10s. for futures. Exports so far this month have been 3413 tons.

Pig Lead.—The price of Soft Missouri Lead in New York was misquoted last week and should have been 4.47½c. instead of 4.57½c., as printed in this report. In the "Comparison of Prices," however, Lead in New York was correctly quoted at 4.47½c. Soft Missouri brands can now be had at 4.45c., New York, and 4.30c., St. Louis. The American Smelting & Refining Company, however, continues to quote shipment Lead at 4.60c.

Spelter.—Spelter prices are firmer and there is nothing obtainable in New York under 4.85c. In St. Louis the market is firm, at 4.70c.

Aluminum.—The price of Aluminum is somewhat unsettled, as the leading producers in this country nominally quote No. 1 Ingots at 33c., but large lots can probably be had at under this figure. Importers also would be willing to make contracts at considerably less prices.

Antimony.—The market is dull and unchanged, although slightly higher. Cookson's is now quoted at 8c. to 8½c., Hallett's at 7.75c. to 8c., and outside brands at 7.50c. to 7.75c.

Nickel.—The price of Nickel is unchanged, at 45c. for ton lots and 50c. to 60c. for smaller quantities.

Tin Plates.—The price is unchanged, at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. I C Coke Plates.

Old Metals.—Dealers quote selling prices as follows:

	Cents.
Copper, Heavy and Crucible	12.50 to 12.75
Copper, Heavy and Wire	12.25 to 12.50
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	9.25 to 9.50
Brass, Light	7.25 to 7.50
Heavy Machine Composition	11.75 to 12.00
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.50 to 9.75
Lead, Heavy	4.20 to 4.25
Lead, Tea	3.85 to 3.90
Zinc Scrap	3.20 to 3.50

New York.

NEW YORK, October 7, 1908.

Pig Iron.—The market has been very quiet, the selling movement which characterized the last two weeks of last month having spent its force. With the exception of two or possibly three of the larger Eastern Basic Steel plants, few important melters have purchased any considerable quantities for delivery during the first quarter, and the majority of consumers, large and small, except possibly in New England, have not even covered all of their requirements for this year. We quote, at tidewater, Northern No. 1 Foundry, $17.25 to $17.75; No. 2 Foundry, $16.75 to $17.25, and No. 2 Plain, $15.75 to $16.25. Alabama Irons are quoted $17.50 to $17.75 for No. 1 Foundry, and $16.75 to $17.25 for No. 2 Foundry.

Structural Material.—Very low bids, in some cases below the cost of unsuccessful bidders, are still the feature of current Structural business. Fabricators and Steel companies are sharing in these cuts, which have certainly brought Structural work to a basis calculated to be tempting to capital. Railroad work figures as an unimportant second in recent contracts. The Plate girder bridges of the Northern Pacific, 2100 tons, have been awarded to the McClintic-Marshall Construction Company. The bids on the Keithsburg Bridge over the Mississippi are still under consideration by the Iowa Central. At Cincinnati bids are asked for 2000 tons of Steel for the Cincinnati Southern's new viaduct in the city. In New York City bids are being received on the Ritz-Carlton Hotel, which will be erected as two buildings, on Madison avenue, between Forty-sixth and Forty-seventh streets, one taking 3000 tons and the other 2000 tons of Steel. Bidders are asked to base estimates on Eastern Steel Company sections. The New York Central is asking bids on the second section of its Grand Central terminal. The Milliken Brothers' receivers, who are understood to be the low bidders on the Emigrant Savings Bank, 5500 tons, have also taken this week the Great Northern Hotel, on Lexington avenue, above Sixty-fifth street, 1500 tons. On both these contracts the Bethlehem Steel Company's Gray Shapes will be used. The American Bridge Company added to its previously reported September business 2500 tons for two bar mills for the new plant at Gary, Ind. With the reservation that must be made concerning a number of Struc-

tural contracts involving concessions, we quote as follows on tidewater deliveries of plain material shipped from mill: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles, over 6 in., the extra is 0.10c. Structural Material, cut to lengths, is sold in small lots at about 2¼c.

Bars.—The volume of local business in Bar Iron is less than in September, and every order is the subject of sharp competition. Eastern Pennsylvania mills have accumulated quite a little work in the past few weeks, as they are now making much larger shipments. The usual quotations on Eastern Bar Iron are 1.45c. to 1.50c., tidewater, but some Iron has been sold at a lower rate. As a related industry, conditions in the Wrought Iron Pipe trade are much better, the demand being strong, with considerably more doing in the East than for many months. Steel Bars are unchanged, at 1.56c., tidewater.

Plates.—Sales agents report a fair run of orders for small lots. Prices are held as follows at tidewater for standard sized Plates: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Firebox Plates, 2.65c. to 3.50c., according to specifications.

Ferroalloys.—Business appears to be considerably better in the West than in the East. Prices are unchanged, Ferromanganese being quoted at $43 to $43.50, Baltimore, and 50 per cent. Ferrosilicon at $68 to $70, delivered.

Old Material.—Although some of the large Bar manufacturers are not buying, Railroad Wrought Scrap commands outside figures, on account of its comparative scarcity. Borings and Turnings are in good demand, the supply also being rather limited. Standard Steel Car Axles are being sought by some consumers. Very little Old Material of any kind is pressing for immediate shipment, and prices are quite firmly held. It is remarkable how well prices have been maintained, considering the fact that so many large buyers have been out of the market for some time. Ruling quotations are as follows, per gross ton, New York and vicinity:

Old Girder and T Rails for melting	$11.50 to $12.00
Heavy Melting Steel Scrap	11.50 to 12.00
Old Steel Rails, rerolling lengths	14.00 to 14.50
Relaying Rails	22.50 to 23.00
Old Iron Rails	16.50 to 17.00
Standard Hammered Iron Car Axles	18.50 to 19.00
Old Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	15.00 to 16.00
Iron Track Scrap	12.00 to 13.00
No. 1 Yard Wrought, long	14.00 to 14.50
No. 1 Yard Wrought, short	12.50 to 13.50
Light Iron	7.00 to 7.50
Cast Borings	7.50 to 8.00
Wrought Turnings	8.50 to 9.00
Wrought Pipe	11.00 to 11.50
Old Car Wheels	14.50 to 15.00
No. 1 Heavy Cast, broken up	13.50 to 14.00
Stove Plate	11.50 to 12.00
Locomotive Grate Bars	11.50 to 12.00
Malleable Cast	12.50 to 13.00

Cast Iron Pipe.—Verona, N. J., opened bids September 28 for about 1000 tons of 6 to 12 in. Water Pipe for a new installation. The range of bids was from $22.86 to $24.25, delivered. Some technicality caused the lowest bid to be thrown out, and the contract was awarded to the leading interest at $22.95, delivered. The general condition of the trade is one of extreme quiet, with orders far apart. On small lots the market is firm, as most manufacturers are not inclined to compete sharply for this class of business. Quotations are, therefore, continued at $24 to $24.50, at tidewater, for carload lots of 6 in.

The foundry of Isaiah Page's Sons, at Albany, N. Y., will permanently close October 15, and the plant will then be sold or dismantled. It was established in 1826 by Isaiah Page, grandfather of the present owner, Charles M. Page, at Chatham, Columbia County. In 1855 it was removed from Chatham to Albany, and has remained in its present quarters for 58 years. When the foundry was built in Albany the growth of the city was not foreseen, and what at that time was the outskirts now lies within a few blocks of the State House. Owing to objections to smoke by adjacent property owners and the increased value of the land, Mr. Page has decided that it is no longer advisable to continue operations in this location. The plant has been engaged largely on special work for railroads, several railroad companies having been customers of the foundry since they first began operations. The present owner will probably rest for a year, and may then form a connection with some malleable iron foundry, but does not contemplate resuming business for himself.

The Etna Forge & Bolt Company, Pittsburgh, Pa., which heretofore has operated under a partnership, has applied for a charter with a capital of $50,000. A number of improvements will be made to the plant. The company manufactures forgings, bolts, washers and other articles used in the construction of cars, to which will be added rivets, chains and structural material. The company recently purchased a lot, 52 x 80 ft., adjoining its plant in Etna, on which an additional building will be erected, and in which machinery will be installed for the manufacture of the new products. Ground will be broken for the erection of the new building this month, and the company expects to have it in operation by the first of the year.

The Pittsburgh Foundrymen's Association.

The Pittsburgh Foundrymen's Association held its regular monthly meeting at the Hotel Henry, Pittsburgh, on the evening of October 5. A dinner preceded the meeting, at which about 50 were present. The formal proceedings were opened at 8 p.m. by President H. E. Field. Secretary Zimmers read a statement covering the association's trip of inspection to the plants of the Jamison Coal & Coke Company in Westmoreland County on Labor Day.

The election of officers was taken up, and C. H. Gale was elected president; Joseph T. Speer, vice-president; John M. McLaren, treasurer, and F. H. Zimmers, secretary. The Executive Committee consists of H. E. Field, John A. Logan, E. D. Frohman, B. D. Fuller and W. A. Johnson. The report of the secretary showed that 30 new members were added during the year, the association having 102 members on October 1. Four new applications for membership were received.

E. D. Frohman, chairman of the Publication Committee, submitted a list of subjects, including "Specifications for Buying Pig Iron," "Steel Castings" (by Bradley Stoughton), "Malleable Iron," "Brass," "Pattern Making," "Costs," "Investigations on Metallurgy," etc., on which papers would be read by practical men during the coming year. A full schedule of the subjects and authors will be mailed the members later. A communication was read from Thomas D. West on "Prevention of Accidents in Foundries," which is receiving considerable attention in the foundry trade.

A. N. Spencer, technical engineer of the Harbison-Walker Refractories Company, Pittsburgh, made an instructive address on "Fire Brick for Cupolas." A discussion followed in which Messrs. Fuller, Bole, Field, Phelps, Dammon and Henderson took part, each reciting some of his experiences with refractory materials.

H. P. Spilker brought up the subject of a permanent exhibit of foundrymen's appliances in Pittsburgh, at the request of J. S. Seaman, who was absent, and on his motion a committee of three was appointed, consisting of H. P. Spilker, E. D. Frohman, and F. H. Zimmers, to gather details for such an exhibit. It was brought out that some of the other cities have such exhibits, which are not only educational, but are necessary these days in order to keep up with the development of equipment in the foundry trade.

The outlook for labor employed in British manufacturing industries is regarded as peculiarly unfavorable for the coming winter. Trade statistics show more marked declines, the foreign trade for August representing the largest decline for the year. Compared with August, 1907, the imports fell by £6,544,396, the exports by £7,012,368, the re-exports by £547,494. For the eight months of the year the total fall in imports is £42,045,186; in exports, £30,083,048, and in re-exports, £13,877,782.

The Lebanon Valley Iron Company, Lebanon, Pa., will erect a new 16-in. finishing mill of four sets of housings of the latest improved type, which will be contained in a building, 60 x 260 ft., to be constructed of the same design as the other buildings of the plant. It is expected that the mill will be completed and ready for operation by next spring.

August Exports and Imports of Iron and Steel.

According to the August report of the Bureau of Statistics of the Department of Commerce and Labor, the exports of iron and steel in that month were practically the same as in July, while the imports decreased. The total value of the August exports, not including ore, was $12,058,561, against $12,085,951 in July. Taking the commodities for which quantities are given, the total exports for August were 87,198 gross tons, against 86,806 tons in July, 69,778 tons in June, 64,020 tons in May, 93,522 tons in April, 96,437 tons in March, 81,755 tons in February and 74,352 tons in January. The following table gives details of the exports of such commodities for August and for the eight months ending with August, as compared with the corresponding periods of 1907:

Exports of Iron and Steel.

	August,		Eight months,	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	3,383	5,996	26,452	54,031
Scrap	1,612	1,260	14,437	21,988
Bar iron	659	1,244	4,801	17,743
Wire rods	153	757	3,904	8,919
Steel Bars	2,817	6,671	28,639	47,737
Billets, blooms, &c.	7,865	4,775	80,015	59,044
Hoop, band, &c	534	1,166	3,148	5,031
Steel rails	27,608	37,850	138,787	218,570
Iron sheets and plates	5,291	3,302	29,176	25,401
Steel sheets and plates	5,476	4,233	37,986	59,771
Tin and terne plates	110	848	11,331	8,209
Structural iron and steel	10,409	13,111	81,910	90,039
Barb wire*	4,528	....	8,320	....
Wire	4,252	14,123	81,761	103,850
Cut nails	1,125	398	5,293	4,724
Wire nails	1,953	4,999	18,430	30,750
All other nails, including tacks	398	298	3,008	5,187
Pipes and fittings	9,016	17,761	76,563	100,674
Totals	87,198	118,792	653,961	861,668

* Not separately stated prior to July 1, 1908.

The total value of the August imports of iron and steel not including ore, was $1,414,416, against $1,781,309 in July. Taking the commodities for which quantities are given, the August total was 13,186 gross tons, against 18,320 tons in July, 21,109 tons in June, 13,584 tons in May, 12,342 tons in April, 15,885 tons in March, 19,054 tons in February, and 28,008 tons in January. The following table shows the details of the imports of such commodities for August and for the eight months ending with August, as compared with the corresponding periods of 1907:

Imports of Iron and Steel.

	August,		Eight months,	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	5,200	34,263	56,941	420,117
Scrap	260	5,853	3,262	22,553
Bar iron	971	4,106	14,316	27,039
Rails	41	213	1,051	2,826
Hoop, band, &c	34	31	324	1,347
Billets, bars and steel in forms n.e.s	1,006	1,285	6,653	10,374
Sheets and plates	187	210	1,524	2,802
Tin and terne plates	4,014	3,528	48,185	43,243
Wire rods	1,390	2,084	7,796	12,674
Structural iron and steel	83	127	1,470	1,959
Totals	13,186	51,700	141,522	544,934

The imports of iron ore in August were 47,130 gross tons, against 44,035 tons in July. The total iron ore imports for the eight months ending with August were 424,963 gross tons, against 865,657 tons in the corresponding period of 1907.

The total value of all kinds of exports of iron and steel, not including ore, for the eight months ending with August, 1908, was $105,258,962, against $129,400,247 for the corresponding period of 1907. The total value of similar imports for the eight months ending with August, 1908, was $13,407,611, against $28,795,578 in the corresponding period of 1907.

The Franklin Institute, Philadelphia, held a section meeting on the evening of October 1. At this meeting Prof. A. E. Outerbridge, Jr., president of the Mining and Metallurgical Section, delivered his opening address, in which he gave a résumé of progress in the metallurgical arts in the past two years, and said that the principal advances noted by him within that period have been along the line of perfecting various new processes that had been previously discovered and announced to the world. In the course of this address he alluded to the substitution of so-called alloy steels in place of carbon steels heretofore used for cutting tools; the use of ferrosilicon in the foundry for the purpose of increasing the strength and eliminating the ordinary brittleness and hardness of cast iron; the investigations into the character and composition of molds into which molten iron and steel are poured; the reduction in cost of making molds and cores by machines, and the remarkable progress in reducing low grade metalliferous ores. He congratulated his hearers upon the prospects before them of increased activity in their various occupations, hoping that the improvement will continue steadily increasing in force, so that ere many weeks shall have elapsed we may look back upon the present period of depression as a thing of the past from which valuable lessons may be learned. Robert Job also made an address on "Economy in Purchase of Supplies."

Iron and Industrial Stocks.

NEW YORK, October 7, 1908.

Although the political outlook appears to be fully as uncertain as it has been, and the European prospect is clouded by the warlike developments in the Balkan Provinces, the market on Iron and Steel stocks holds remarkably firm with some showing an upward tendency. General stock market conditions have been greatly improved by the successful financing of threatening railroad obligations. The range of prices from Thursday to Tuesday on active Iron and Steel stocks was as follows: United States Steel common 45 to 46⅛, preferred 108¼ to 109⅝; Bethlehem Steel common 21 to 22¾; Car & Foundry common 39 to 40½, preferred 102⅞ to 103; Locomotive common 45¾ to 47, preferred 104; Steel Foundries, new, 29½ to 30; Cambria Steel 35⅞ to 36¼; Colorado Fuel 34¼ to 35⅞; Crucible Steel common 6½, preferred 40⅝ to 42; Pressed Steel common 31¼ to 32¾, preferred 92; Railway Spring common 37 to 39, preferred 97 to 98; Republic common 21½ to 22½, preferred 78½ to 79½; Sloss-Sheffield common 60¼ to 61¼; Cast Iron Pipe common 23¾ to 25, preferred 71¾; Can common 5⅞ to 6⅝, preferred 60 to 66½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 46⅛, preferred 109¾; Car & Foundry common 39¾, preferred 102; Locomotive common 46⅞, preferred 104⅜; Colorado Fuel 35⅝; Pressed Steel common 32½, preferred 92; Railway Spring common 38½; Republic common 22¼, preferred 80; Sloss-Sheffield common 61½; Cast Iron Pipe common 24¾, preferred 71½; Can common 6⅜, preferred 65⅞.

The American Car & Foundry Company reports its net earnings from operation for the quarter ending July 31, 1908, to be $684,041.41. The dividends for that quarter were: No. 38, on the preferred stock, at the rate of 1¾ per cent. per quarter, $525,000, and No. 24, on the common stock, at the rate of ½ per cent. per quarter, $150,000. The amount carried to surplus was $9041.41, making it $22,376,288.76 on July 31.

Dividends.—The E. W. Bliss Company has declared a quarterly dividend of 2½ per cent. on the common stock and 2 per cent. on the preferred stock.

The Nova Scotia Steel Company has declared the regular quarterly dividend of 2 per cent. on the preferred stock, payable October 15.

The Vulcan Detinning Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable October 20.

The Standard Underground Cable Company, Pittsburgh, Pa., has declared a quarterly dividend of 3 per cent., payable October 10.

The American Rolling Mill Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 15.

The report that the Carnegie Steel Company will build five hoop mills and five bar mills at its Ohio Works at Youngstown is officially stated to be untrue. It is possible that at some future time finishing mills will be erected at these works, but at present no new construction is contemplated, other than the two blast furnaces and the 12 open hearth furnaces which have been under way for about a year.

The New Haven Iron & Steel Company.

The annual meeting of the New Haven Iron & Steel Company was held at Camden, N. J., October 5. From the report of the retiring president, C. C. Kauffman, the following extracts are taken:

"This company, organized in 1899, has just concluded its ninth year of business. This is the first time in its history when dividend checks have not gone out to the stockholders along with the president and treasurer's reports, and the notice of the annual meeting. But the stockholders should not forget that the past year has been one of unusual depression in all lines of business, and especially in the iron trade. Neither should they forget that, during the first five years of this company's business, it paid 13 dividends, and during the next three years (1905, '06, and '07) three annual dividends of 6 per cent. each, all under the same continuous management as now. These 16 dividends amounted to 65 per cent. ($325,000) on the capital stock of $500,000, or an average of over 7 per cent. per annum, for nine years, which is more than any other similar enterprise in the country paid to its stockholders during the same period. In addition to this sum total of dividends, the company earned $57,229.04, making the total earnings $397,229.04, an amount exceeding three-fourths of the capital stock.

"To further emphasize the present unfavorable condition of the iron market, it is only necessary to say that in August, 1907, our average selling price of finished iron was $45.88 per ton; in August, 1908, it was only $37.40, a decrease in the selling price of $8.48 per ton. And because of the increased demand for scrap for consumption in open hearth steel plants, and the unwillingness of the railroads to provide new equipment, the prices for old materials have not fallen in proportion. Unfortunately, trade conditions limited demand and output, and the mill was in operation only 132 days. Its output was not a third of its capacity.

"The annual statement of the treasurer shows a loss of $11,777.96. This loss has not resulted from the operation of the plant, and is not the fault of the board nor of the management; it results from the inventory of the stock on hand at the mill, at general prices now prevailing, which are about 16 per cent. below those of a year ago.

"The total inventory shows a depreciation in values of $13,623.95, or more than the loss indicated by the statement, and proves conclusively that this depreciation, and not errors of management, is responsible for the results of the year's operations. When values become normal again, the appreciation of the inventory will exceed the loss shown in the statement. Our quick assets, together with the cash dividends heretofore paid, would give to every stockholder, in cash, more than par for his stock, and have the plant left unencumbered.

"The total amount of business done since organization was $5,100,000. The total amount of bad debts in nine years was $7,270.29, or 14¼ cents on each thousand dollars' worth of business.

"The annual statement of August 31, 1908, conservatively made, shows quick assets as follows: Book accounts receivable, $36,722.17; bills receivable, $13,916.08; inventory values, $91,030.50; cash in bank, $4,935.74, making a total of $146,604.49, not including the item of $49,326.26, representing the ten thousand shares of our capital stock held by the company. The indebtedness of the company—bills payable—at the same time was only $6,264.58. The same statement shows a surplus of assets over liabilities of $68,999.66."

C. C. Kauffman having declined to serve further as president, Kennedy Crossan was elected to succeed him.

The Carnegie Steel Company has closed a contract to furnish two Harveyized armor plate vaults for the First National Bank, Pittsburgh, which will be installed in the new bank building now being erected. These vaults will be 14 x 25 ft. The Carnegie Steel Company has also sold a large armor plate vault to the Old Colony Trust Company, Boston.

The Allis-Chalmers Company's Report.

The seventh annual report of the Allis-Chalmers Company shows that the operating profits for the year ended June 30, 1908, amounted to $2,573,960.93, or more than double those of 1907. The surplus after all charges was $385,997.29, comparing with a deficit last year of $229,817. In his remarks to stockholders President W. H. Whiteside says:

"Noteworthy success has been attained in the sale and operation of our new lines of production, namely, gas engines, steam turbines, hydraulic turbines and electrical apparatus, which are now among the standard products of our company, their development having been completed since the last report. The extended use of these lines of production, often in connection with our older products, not only by purchasers who have long been our regular customers, but by numerous new customers in almost all classes of industry, forms the basis for an increasing and profitable business."

The detailed income account for the year, with comparisons, is as follows:

	1908.	1907.
Profit on operations	$2,573,961	$1,226,242
Maintenance, depreciation, interest, &c.	1,958,147	1,613,540
Net profits for year	$615,814	*$387,298
Previous profit and loss deficit	229,817	†157,481
Surplus	$385,997	*$229,817

* Deficit. † Surplus.

The item, profits on operation, as above, is after deducting expenses of manufacturing and selling; dividends on preferred stock of the Bullock Mfg. Company and ordinary provision for doubtful accounts.

During the year advantage was taken of an opportunity to sell the old South Foundry and three vacant lots at the Reliance Works, no longer required for business purposes. Part of the proceeds were used to install a new brass foundry at the West Allis plant to replace the one vacated on the South Foundry property; the balance to acquire some real estate in West Allis and to purchase in the open market 131 of the company's first mortgage bonds, which have been canceled.

The report adds: "Inasmuch as owing to present financial conditions there may possibly be a shrinkage in the collection of certain bills receivable, it has been deemed advisable, out of abundant caution, to set aside out of profits a special reserve of $60,000. Beginning with the second quarter and continuing for half of the company's fiscal year, owing to the severe contraction in general business throughout the country, the volume of the company's sales averaged about one-half of normal. During the last quarter there was a gradual and steady increase in orders booked."

The balance sheet shows reductions in the inventories amounting to $2,518,841; increase in notes and accounts receivable of $272,137; increase in cash of $1,059,300, and decrease in accounts and notes payable, amounting to the substantial sum of $2,304,413.

The Mesta Machine Company, Pittsburgh, Pa., has just made shipment of two 44 and 84 x 84 in. high pressure and two 84 and 84 x 60 in. low pressure long cross head blowing engines to the Cleveland Furnace Company, Cleveland, Ohio, to furnish air for its new No. 2 furnace, and has also shipped it a Helander barometric condenser of sufficient size to condense the steam for the above mentioned engines and for three additional blowing engines built by the Mesta Machine Company four years ago for this company's No. 1 furnace. The Mesta Machine Company reports considerable improvement in business in all its departments during the past few weeks and the work in hand and recent contracts secured enabled it on October 1 to start operating its plant full time, in place of five days per week for some time past. The improvements on which the company has been engaged during the past summer are being rushed now as fast as possible and it hopes to have them completed in about 60 days, which will greatly increase its capacity.

The Machinery Trade.

NEW YORK, October 7, 1908.

Merchants generally report a slightly better demand for machinery and feel somewhat encouraged over the increase in inquiries and the renewed interest taken by the large industrial corporations. Up to within the past few weeks the business consisted almost wholly of orders from the small industrial plants, with the exception of the business placed by the automobile companies, which have bought quite extensively, but in the past week or 10 days the more important interests have come into the market for fair sized lots of tools, several amounting to from $8000 to $10,000 each, While the railroads have come into the market in a small way, nevertheless it is the opinion that the renewed activity indicates larger requirements in the near future. Politics are still adversely affecting business, but it is believed that as soon as the situation is satisfactorily cleared a marked improvement will be noticed; in fact, some believe that the encouraging way October has opened indicates that the large interests are satisfied that there will be no developments to retard the improvement that has taken place.

There were quite a number of visiting machinery men in New York last week, many of them having attended the formation and the subsequent Executive Committee meetings of the Railway Business Association, while the Electrical Show at Madison Square Garden was also an attraction to visitors. While all of the visitors were agreed as to the general sentiment expressed at the Railway Association meetings that there is a dearth of railroad business, many of them report live inquiries from other industrial sources, and the gloomy outlook expressed over the railroad situation, it was generally declared, should not be applied to other industries. While there were no records of business transacted among machinery men exhibiting at the Electrical Show, those in charge of the exhibits said that there appears to be a live interest taken in the machinery situation and many of the inquiries made at the various machinery booths were from possible purchasers.

Considerable progress is being made in the preparation of plans for its new plant by the International Car Company, New Orleans, La., which was incorporated about the middle of July with a capital stock of $350,000, and it is expected that within the next three weeks the company will have the details of its plans settled. In addition to the preparation of plans for the new building the company is now selecting the machinery that it will require for the plant, and as it is the intention to install modern equipment electrically operated, the company will purchase a full line of woodworking machinery and the necessary ironworking machinery, together with boiler, engine, dynamo, and motors. Many of the officers and directors of the company are either interested in railroads or in the manufacture of railroad equipment and the company has been assured of all the work it can handle.

The New York Central Railroad has inquiries in the market for a few machines for its New York terminal work. This company has purchased quite a large amount of machinery during the past few months and is likely to be in the market for some time for equipment for its various shops, especially those at West Albany, which it is materially enlarging.

The trade is considerably interested in the large car barn to be constructed on Fifty-fourth street by the Metropolitan Street Railway Company, New York, as it is understood that quite a little mechanical equipment will be installed in the structure. The company has inquiries out for a few machines which are understood to be for the new barn. The building will be of brick and ornamental stone, 135 x 298 ft., five stories in the main part and three stories in the annex. It is intended, however, only to build two stories at the present time.

From a statement made by Thomas J. Freeman, receiver of the International & Great Northern Railroad, it is evident that the shops at Taylor, Texas, which were recently destroyed by fire, will be rebuilt on the old site and on a much larger scale. It is understood that the new shops will be built as soon as the plans can be prepared.

In the early part of the year we stated in these columns that the Transcontinental Railroad, Ottawa, Ont., intended to erect new shops at St. Boniface. The company is now going ahead with the work and has asked bids for grading the site for the shops. As soon as the preliminary work is finished it is probable that announcement will be made of the plans for the new buildings.

Since the first of the month the railroads have come into the market a little more freely, but orders covered only a few machines, some of them, however, of the heavier type. The Chicago Pneumatic Tool Company, New York, which has recently received some good business from the railroads, has sold air compressors to the New York, Ontario & Western and the Lehigh Valley railroads. The company reports quite an improvement in its business.

Inquiries are now in the market for part of the equipment for the new foundry to be erected at Yonkers, N. Y., by the Otis Elevator Company, New York. This building will be 90 x 200 ft., of brick and steel construction, and when completed will more than double the company's foundry capacity at that point and be sufficient to supply all castings required. The Pittsburgh offices of the company now occupy the entire twelfth floor of the Keenan Building, Seventh street and Liberty avenue.

The Ridgway Mfg. Company, general machinist and founder, Ridgway, Pa., has under consideration the purchasing of some machinery for increasing its output. The nature of the buying to be done has not been decided upon, and at any rate the purchases will not be made until about the first of the year.

Purchases of considerable new machinery have lately been made by the Erie Foundry Company, Erie, Pa., which last week awarded contract for rebuilding its machine shop destroyed by fire some months ago. The company has purchased practically all the equipment required for this new building, which will be 100 x 100 ft.

Henry Doherty, silk manufacturer, of Paterson, N. J., has had some inquiries in the market regarding equipment for a new mill, the erection of which he has under consideration. Mr. Doherty states that the project has not been entirely decided upon, and the inquiries now in the market were made with a view to getting information as to costs, &c.

The Metropolitan Electric Company, Reading, Pa., intends to erect a new power plant at a cost of $1,500,000, to supply funds for which first mortgage bonds will be issued.

The Newburgh Light, Heat & Power Company, Newburgh, N. Y., has made application through the Public Service Commission for permission to issue bonds to the amount of $350,000. Of this amount it is intended to use $25,000 for placing its transmission lines and conduits underground, $18,000 for extending its transmission lines, $39,930 for additional equipment and improvements to the power plant at Newburgh, $100,000 for erecting new transmission lines and the balance for paying off the floating debt, &c.

Some important contracts have been let of late for equipment for the Chattanooga-Tennessee Power Company, which is constructing one of the largest hydro-electric power plants in the country. John Bogert, 141 Broadway, New York, is the consulting engineer for the company, and contracts have been let from his office. The construction of the plant, which is already under way, will involve a large expenditure and the plant when completed will be capable of generating 56,000 hp., which will be used to supply manufacturers in and about Chattanooga, Tenn. The work includes the building of a large lock and dam and the power house, besides a transmission line 15 miles long. The S. Morgan Smith Company, York, Pa., will furnish the hydraulic installation, and the General Electric Company will supply the electrical installation. The Lombard Governor Company has the contract for the governors, and Guild & Co., Chattanooga, Tenn., will build the transmission line. The power house will be located at Hales Bar, and the transmission line from there to Chattanooga will include the construction of a number of steel towers and considerable concrete work.

The Gould Storage Battery Company has purchased a special three-machine exciter set from the Ridgway Dynamo & Engine Company, through the Spooner-Matthewson Company, New York, representative, for its Pennsylvania lines west of Pittsburgh. The machinery will be installed in the company's storage battery installation at Ashtabula Harbor, Ohio.

The Hooven-Owens-Rentschler Company has sold through its New York office a 300-hp. engine to the Lehigh & Wilkes-Barre Coal Company, for installation in the company's plant at Wilkes-Barre, Pa.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 6, 1908.

Conditions in this market are correctly diagnosed as quiet all along the line, but there is a significance in certain acts of those who are strong factors in the iron and steel trade, and this is accepted by the leaders in the machinery line as indicative of better business directly or soon after election. A number of foundrymen seen during the week note that their melt is improving slowly but surely, and some of these have received good orders for castings for early delivery. The major part of these deliveries will be made to manufacturers of electrical power and ice manufacturing machinery, makers of planers, milling machines, drills and drill presses, shapers and lathes. One local foundryman received an order for over 100 pieces from a manufacturer. From two to three heats per week of 12 to 15 tons a day the melt has increased to an average of four or five per week of 15 tons each, and prospects are that soon after election normal conditions will be resumed.

With tool manufacturers in this section September closed

much better than it began, inquiries were from 40 to 50 per cent. better and some tardy sales have been closed. The first few days of October have not brought such excellent returns as might have been expected, taking the entire field into consideration, but manufacturers attribute this rather to election excitement than a disposition to do without needed tools. Judging from the tone of correspondence that the election over and results to their liking, some excellent lists of tools pigeonholed temporarily will be sent out immediately.

There has been considerable discussion here of the Iron Buyers' Association, which seemed to be an important factor in the iron markets of the Central West last winter and Spring, but so far as could be learned here the contract form designed and authorized for use by the association has not found much or any favor with furnacemen. Local selling agents report that all sales are made as usual on the designated form of the furnace companies. It is possible that some further modifications of the form or additional correspondence with the furnace people may bring about better results. The annual meeting of the association was held at the Phillips House, Dayton, Ohio, September 30, with President G. H. Gorman of the Davis Sewing Machine Company in the chair. Between the morning and afternoon sessions dinner was served in the banquet room of the hotel, and informal talks by members on important points of the iron market made this feature both entertaining and profitable. The following officers were elected: President, G. H. Gorman of the Davis Sewing Machine Company, Dayton, Ohio; vice-presidents, Theodore Bollman of the Bollman-Wilson Foundry Company, Cincinnati; A. F. Sparks of James Leffel & Co., Springfield, Ohio; George M. Verity of the American Rolling Mill Company, Middletown, Ohio; Felix Kahn of the Estate Stove Company, Hamilton, Ohio, and J. W. Jeffrey of the Ohio Malleable Iron Company, Columbus, Ohio; secretary and treasurer, Wm. Gugenheim of the Foos Mfg. Company, Springfield, Ohio.

A number of local tool manufacturers have taken advantage of the period of inactivity and made various improvements to the inside or outside of their plants. Conspicuous among these, the American Tool Works Company devoted its attention to the exterior side to excellent advantage and the large establishment at Sixth street and Eggleston avenue looks like new in a dress of metal. Sundry improvements have also been made on the interior of the plant.

October promises to be an important month to the manufacturers generally in this section. Cincinnati will be the host the 26th of the members of the Administrative Council of the National Metal Trades Association, who will meet with Commissioner Wuest at the committee rooms in the Fourth National Bank Building to go over the records of the past six months. President F. K. Copeland of the Sullivan Machinery Company will preside.

Nearly 200 members of the Business Men's Club went by special train to Richmond, Ind., to participate in the Manufacturers' Day parade of the Richmond Fall Festival, October 7. The greater part of these were tool manufacturers and builders of woodworking and special machinery, all of whom are great believers in the exchange of civilities and industrial ideas between manufacturers of a section or community.

The Norwood and Oakley districts, which have grown so rapidly in a manufacturing way the past two or three years, are getting additional *éclat* through concerns closing and negotiating for sites. The latest to arrange for a new home is the Virginia Can Company of Buchanan, Va., although it is understood that the Buchanan plant will be continued as usual, with C. C. Huffman president and principal stockholder in both. Mr. Huffman has acquired for approximately $8000 a tract of little more than 3 acres in Norwood, a part of the division on which is located already the large establishments of the Dana Mfg. Company and the Weir Frog Company. The property has a frontage of about 800 ft. on the right of way of a branch of the Pennsylvania Railroad. Fireproof buildings of brick, concrete and steel, one for manufacturing, the other for warehouse purposes, will be erected at once, Mr. Huffman, who is now in the city, arranging these details before leaving for Buchanan. The plant will have a capacity of 250,000 cans daily and will employ about 200 hands. Mr. Huffman hopes to have the plant ready for operation before the end of the year. The railroad has completed a survey for a private siding of 500 ft. The company will manufacture packers' cans exclusively and will be the first factory of this kind in or about Cincinnati. The factory will be so arranged that the sheet metal will be taken in at one end of the building and the cans, in various stages of completion, carried through and loaded into cars by machinery at the other end. Only heads of departments will be brought to Cincinnati from the East, the remainder of the employees being secured locally.

Reports from Columbus indicate that the anvil and vise departments of the Columbus Forge & Iron Company are being operated to almost full capacity, with a good outlook for the future.

At the Indianapolis plant of the American Car & Foundry Company conditions are reported promising, and a good sized contract for immediate repairs on cars of a variety of patterns has been secured. The company has made several important improvements on its buildings and is well equipped to handle work expeditiously.

A report from Noblesville, Ind., announces the purchase of 10 acres of ground adjoining the present factory of the Atlanta Tin Plate Company, which will be used for new buildings and an enlargement of the galvanizing department. The report also states that foundations have been placed for two additional hot mills, making six in all.

President H. A. Lanman of the Columbus Bolt Works and the Columbus Machine Company is quoted as saying that September closed quite satisfactorily with his companies, particularly the bolt company, and that the bulk of business for both is coming from the Northwest and the South.

Cleveland Machinery Market.

CLEVELAND, OHIO, October 6, 1908.

Business continues to improve slowly with the majority of the local machine tool builders. The most encouraging sign of better business conditions, however, is in the volume of inquiries. Manufacturers, with scarcely an exception, report a great deal of improvement in the number of inquiries, a good percentage of them being for fair sized lots of good sized tools. Some of the tool builders feel quite optimistic over the outlook, and they say that should buyers receive a little more encouragement by a further improvement in general business conditions their sales will show a decided increase. While no large inquiries are coming out, there is a larger proportion for several tools, some being for from five to ten. The demand for automatic machinery is picking up as well as for other lines.

Orders and inquiries at present are mostly coming from the larger manufacturing plants of all kinds that are adding to their equipment or replacing old tools. Although the majority of the automobile builders in the Central West are about through buying for the season, the scattered business that has come from this source during the past few days has amounted to considerable in the aggregate. Two of the large rubber plants in Akron which are about to erect extensive factory additions, will also enlarge their machine shops, and have placed orders for a number of machine tools. Railroads are showing a little more activity. The Wheeling & Lake Erie Railroad, which bought several tools a few weeks ago for the temporary shops at Norwalk, which are taking the place of those destroyed by fire, is expected to be in the market in about a month for machinery equipment for the new shops that will be built. Representatives of other railroads in this territory have been looking over dealers' stocks with the view of making some purchases soon. Local dealers have received another inquiry for about a dozen tools for the Rock Island Railroad. Local tool builders also report some improvement in their foreign business.

While the outlook with the dealers has not improved as much as with the builders, the majority of the former report some improvement in the demand for standard tools. The demand for second-hand tools is fairly good, but the supply of good used tools is rather limited. Few have been thrown on the market by forced sale, and the present supply is coming from concerns that are throwing out old tools, and these, as a rule, are very old.

The demand for light gray iron and heavy castings shows very little if any improvement. Two or three local foundries have recently taken some good orders and are running about full, but the majority continue to run at about half their capacity.

The Cleveland Automatic Machine Company has recently received an order from the Maxwell Briscoe Automobile Company, Tarrytown, N. Y., for seven automatic machines and one from the American Steel Wheel Company, Alexander, Ind., for four automatic machines. This company has also secured some good foreign orders. Regarding the present outlook, the Cleveland Automatic Machine Company states: "While orders so far have improved only slightly, inquiries with us are four times as good as they were 60 days ago, and our estimating department at present has all that it can do. Inquiries are coming from all kinds of manufacturers, with the exception of tool builders. If business conditions would show only a slight further improvement so as to encourage the prospective buyers, we believe that orders would become quite plentiful and that we would secure some single orders for as many as from seven to ten machines."

At a recent meeting of the creditors of the Brown-Cochran Company, maker of gas engines and refrigerating machines, Lorain, Ohio, a committee was appointed to straighten out the financial affairs of the company. The committee has decided to adopt one of three courses: reorganize the company, sell the plant outright, a cash offer having been received, or to consolidate it with another concern manufacturing gas engines. In case of reorganization or consolidation the plant will probably be enlarged. The report of accountants showed the book assets to be $515,000 and the liabilities $519,000. These figures do not include the capital stock of $140,000.

The Rickersberg Brass Company has completed its new plant at Perkins avenue and East Thirty-seventh street. The main building is 70 x 250 ft., one story, and the foundry building is 50 x 60 ft. The erection of an addition to the foundry, 50 x 70 ft., has been started. The company will manufacture a staple line of plumbers' brass goods. E. Rickersberg is president, treasurer and manager.

The Hitchcock Motor Company, Warren, Ohio, has been incorporated to manufacture automobiles. It is expected that operations will be started early in the spring. W. H. Creahan is the manager.

The Republic Stove & Mfg. Company will erect an addition to its plant on East Fortieth street, Cleveland. The building will be 60 x 74 ft., of brick, two stories high. The company will be in the market about the first of the year for the necessary equipment.

The Toledo Electric Vehicle Company, Toledo, Ohio, has been incorporated with a capitalization of $50,000 to manufacture electric automobiles. The incorporators are Willard E. Allen, A. F. Clark, Frederick B. Willard, E. J. Hall and J. W. Schaufelberger. The company has secured a building for a manufacturing plant at Collingwood and Delaware avenues.

Mortimer & Alcorn, machinery dealers, 423 Schofield Building, Cleveland, have been given the agency for northern Ohio of the Kern Machine Tool Company, Cincinnati.

The Steel Fabric Tire Company, Cleveland, has been incorporated with a capital stock of $25,000 by J. M. Shallenberger and others.

The Cleveland Crane & Car Company, Wickliffe, Ohio, has changed its name to the Cleveland Crane & Engineering Company, the latter name being regarded as more appropriate in view of the extension of the company's activities.

Chicago Machinery Market.

CHICAGO, ILL., October 6, 1908.

According to the reports of machine tool dealers the business of last week brought out nothing of exceptional interest either in character or volume. But considering the retarding influences, political and otherwise, under which the industry is laboring, trade exhibits a degree of vitality hardly to be expected under the circumstances. In spite of a considerable proportion of machine tool capacity now inactive in various manufacturing shops, there is a recognized need of improved facilities in many factories which is being met by the purchase of improved machines to replace less efficient equipment. This movement is by no means general, but there is enough of it so that, added to other demands, it helps materially to keep things moving.

Milling machines and grinders appear to have the lead in demand over other machine tools, and in commenting on this feature of the trade a leading machine tool merchant attributed the growing popularity of these tools to an awakened realization among users, of the wide range of work upon which they can be economically employed. Milling machines are finding a place in small shops, as well as in the large manufacturing plants, because of their demonstrated efficiency in accuracy and output for many operations heretofore performed in part by one tool and in part by another. Grinding tools also command more attention because of modern improvements which contribute to speed and accuracy and fit them for work which was not thought of in connection with the cruder machines formerly made.

While business in all machinery lines is comparatively quiet so far as actual transactions are concerned, there are quite a number of inquiries coming out that indicate prospective interest. These are being followed up in more than usual diligence by the trade, but in many cases it is found that immediate purchases are not contemplated. It shows, however, that there is a waiting demand of no mean proportions which will develop into active business as soon as conditions become more settled. The quadrennial bugbear of pre-election hesitancy is undoubtedly a retarding factor of more or less importance; at least, it is popularly supposed to have a strong influence in that direction. At the same time there are no indications that the small industries throughout the West are seriously affected by such considerations, and they at the present time constitute the market's strongest support.

The Independent Die Company, Inc., maker of cutting dies, with factories at Brockton, Mass., and St. Louis, Mo., is planning to build a one-story factory building, 50 x 110 ft. at La Salle street and Jefferson avenue, St. Louis, Mo. Construction will not be begun, however, until some time next spring. The equipment for this shop will consist of such tools and machinery as are required in a modern die shop.

Hill, Clarke & Co., Chicago, have just received the first tool shipped to them by the Universal Boring Machine Company, Hudson, Mass., for which they are distributing agents. This is the universal horizontal boring machine described in *The Iron Age* of October 1. The machine has been set up and is being operated in the demonstrating shop. It is designed for boring, drilling and milling, and is particularly adapted for finishing castings requiring these three operations on the same piece. Aside from the wide range of work this tool is fitted to perform it embodies a number of interesting features in design and construction, which are fully brought out by practical demonstration.

As an indication of the sustained demand for gasoline engines, especially in small units, the Waterloo Gasoline Engine Company, Waterloo, Iowa, reports that for the past three months orders have largely exceeded the output capacity of its factory. To meet the increased demand it is enlarging its works by an addition that will contain about 12,000 sq. ft. of floor space. The company has in preparation a new catalogue which will be ready for distribution in a short time.

In addition to an improved demand for molding machines from agricultural implement foundries noted by Henry E. Pridmore, Chicago, growing interest is manifested in this class of foundry equipment by stove manufacturers from whom quite a number of orders and inquiries are being received. The company will within a short time have ready for distribution a new stripping plate catalogue.

The Hoefer Mfg. Company, Freeport, Ill., taking advantage of the opportunity offered during the dull period, has made a number of improvements in its factory, including the building of several special tools for its own work.

The Waterous Engine Works Company, St. Paul, Minn., is planning new plant improvements to be made in the near future, which will include additions to present buildings. Its equipment has recently been increased by the installation of some new tools, which include six new engine lathes, brass lathe, gear cutter, grinding machines and a 42-in. Colburn boring and turning mill. The most interesting feature of the line of fire fighting equipment made by the company is the Pioneer auto fire engine, a four cylinder 80-hp. machine with a capacity of 600 gal. per minute, built to withstand the severest fire department service.

The Board of Public Works of Milwaukee opened bids October 2 for a new 12,000,000-gal. pump for the North Point Water Works. The lowest bid submitted was that of the Platt Iron Works Company, Chicago, for $61,700. The next lowest was that of the Allis-Chalmers Company, Milwaukee, Wis., for $67,000. Other bidders were the William Tod Company, Youngstown, Ohio; the Wisconsin Engine Company, Corliss, Wis., and the Holly Mfg. Company, Buffalo, N. Y. The contract will not be let until all of the plans have been carefully examined.

New England Machinery Market.

WORCESTER, MASS., October 6, 1908.

The machinery trade in Boston and other New England centers does not reflect the improved conditions existing in other important lines of metal manufacturing. The same scattering business that has existed for the past month continues with small variation either way. A little spurt here and there is encouraging, but the average run of orders does not show improvement. The machinery builders, with a few exceptions, report a corresponding absence of improvement. Inquiries are numerous enough, but buyers are still holding back. The general opinion is that people prefer to wait until the election is over. This is not the experience of many of the concerns which use machine tools in manufacturing, the increase in demand noted last week being maintained on a basis approaching and in some cases even up to the normal. Orders are received in greatest volume from districts dependent upon agriculture; in fact, these sections seem to be very largely responsible for better industrial conditions.

In the supply trade there is a slight change for the better, but reckoned in percentages the figure of growth is small. However, conditions as denoted by orders seem more healthy, being more nearly of normal size, instead of being confined to dribbling lots. The season for gasoline engines is about over, excepting that a little later the cranberry bogs will be in the market for pumping outfits used in draining, and in a few cases, in filling the marshes. On the whole, the combustion engine business has had a satisfactory year, as compared to many other lines.

The Automatic Machine Company, Bridgeport, Conn., has recently changed hands and the corporation has been reorganized with a capital stock of $400,000, of which one-half is preferred and the other common. The reorganization was necessary because the company has outgrown its former facilities, a condition illustrated by the fact that the business transacted for the first six months of the current year was 35 per cent. greater than for the corresponding six months of 1907, in spite of the falling off in general business. It is the intention of the reorganized company to build a new factory in the near future to take care of the rapidly growing demand upon its manufacturing resources, as the limit of pro-

duction of the present plant has about been reached. F. J. Kingsbury, Jr., is president of the new company; James Coulter, vice-president and superintendent; Stiles E. Goodsell, secretary, and Norman Leeds, treasurer and general manager. The company manufactures two distinct lines of product, machine tools and marine gasoline engines. In the former class a specialty is made of automatic machinery of all kinds to customers' orders, special wire forming machines and also a stock line of automatic threading lathes, Coulter horizontal nut tappers, power presses and wire crimping machines. In the marine gasoline engine line the specialty is heavy duty marine engines of from 12 to 150 hp., as well as lighter engines for pleasure launches. Other products include oystermen's spur and bevel gear cargo hoists, portable hoists operated by steam or gasoline engines and oyster dredges.

The Bevin Bros. Mfg. Company, East Hampton, Conn., manufacturer of bells, has begun the erection of an addition to its factory, comprising an additional story to two buildings about 30 x 60 ft., and a new one-story building, 60 x 80 ft. The new space will be used for pressroom, pattern room and rolling barrels.

The plant of the Portsmouth Forge Company, Portsmouth, N. H., is to be sold by C. H. Morton, the receiver recently appointed by the court. The business, formerly known as the Eastern Forge Company, and located at Nashua, N. H., was taken over by its creditors about a year ago and temporary reorganization was effected, with Mr. Morton as manager. It was finally decided by the directors that the best interests of all would be served by a receivership and the sale of the property.

The Windsor Machine Company, Windsor, Vt., having found it necessary to enlarge its plant to cope with the demand for its Gridley multiple spindle automatic lathes, is building an addition to its erecting department, 50 x 100 ft.

The Blake & Johnson Company, Waterbury, Conn., has let the contract for a new manufacturing plant. Ground has been broken and work will be rushed that the concrete, which will be used for the foundation and first floor, may be in before freezing weather. The building will be 200 x 260 ft., one story, of concrete and brick, with bluestone trimmings. The roof will be of saw tooth construction, providing ample light. The office building and power house will be planned later. The company states that it is considering both steam and gas for power, and electric drive will be employed. No cranes will be required, nor is it likely that the company will be in the market for machine equipment for the present, as the present shops contain all that will immediately be necessary. The company's business has been gradually improving all summer, but September has been the best month for more than a year, the gross business for the month having been about 25 per cent. more than any other month of 1908. The manufacturing department, which produces hardware that goes into the hands of other manufacturers, is running 10 hr. a day, with three-quarters of the number of operatives which were employed two years ago. No stock is carried, the line being a special one. In the past two weeks orders have been received in greater volume than for a year, and the probability is that part of the works will have to run nights within the next few weeks if present demand for the product continues. The other department of the business is the manufacture of machinery, and this naturally is rather quiet. The new plant, to cost $150,000, is being rushed that it may be finished this winter in the belief that the year 1909 will be the largest in the company's history.

The Marshall Electric Company, 301 Congress street, Boston, Mass., is beginning the construction of a new factory at Hyde Park, Mass. The building will be of reinforced concrete, 80 x 182 ft. and one story. The company states that it is in the market for a sprinkler system and an overhead trolley for moving materials about the building and to the freight depot of the New York, New Haven & Hartford Railroad across a narrow alley from the site.

The Terry Steam Turbine Company, Hartford, Conn., manufacturer of turbine engines, will require considerable new machinery for the new shop building, the erection of which has already begun. The building will be 80 x 200 ft., with monitor roof covering a broad bay which will be served by a 10-ton electric traveling crane. The contract for the crane has not been let, but bids have been asked for it. The company's shop on State street contains quite a large machine equipment, including some tools purchased recently. But the requirements of the business demand much enlarged manufacturing facilities, space for which will be provided in the new shop. The purchasing of machinery will not be hurried, however, but will for the most part be done after the new building has been occupied, which will be at no distant date. Among the tools that will be bought eventually are a floor boring machine, universal milling machine, cold saw, power feed drill and planer. A number of engine lathes will also be needed, but it is practically decided to continue with the same type already installed in the shop. The Terry turbine, though put on the market comparatively recently, has already been installed in a considerable number of power plants.

The American & British Mfg. Company is about to make extensive improvements and changes at its works, Bridgeport, Conn., with the special purpose of increasing the capacity of its automobile engine department, which branch of the business has grown to large proportions, with the promise of continued increase. The improvements involve the expenditure of some $35,000 for machinery, contracts for some of which have been let. On land adjacent to the present works will be erected a new building 50 x 150 ft. and one story, constituting two bays of a structure which will be extended from time to time as additional facilities are required. This building will be used for painting, testing and shipping engines. The roof of one of the existing buildings will be raised two stories and the space between two walls will be roofed in, giving altogether an important increase in floor space. The ordnance department of the works will be concentrated, releasing existing space for the engine department. The rearrangement will mean room for a large amount of new machinery.

The new factory of the Flexible Tire Company, Inc., Springfield, Mass., mention of whose machinery requirements has been made, will be located at Easthampton, Mass., where a suitable building has been secured for the purpose.

Recently announced manufacturing building plans include those of the Macfarlane Bros. Mfg. Company, Bridgeport, Conn., silverware manufacturer, new plant; Lawton Mills, Plainfield, Conn., textile manufacturer, addition 200 ft. long and one and two stories; Brockton Heel Company, Brockton, Mass., addition 45 x 55 ft. and four stories; Muller Gloria Silk Company, South Norwalk, Conn., addition 40 x 300 ft. and one story; Russell Mfg. Company, Middletown, Conn., textiles, additional story, 50 x 100 ft.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 6, 1908.

Reports received from many manufacturers of machinery and tools since the close of September show that conditions during that month have been somewhat diversified. A number of manufacturers report slight gains over previous months; others note that business showed a decline, while the larger number, perhaps, have found trade to have been on a fairly even basis. The chief drawback to more active conditions is almost universally believed to be due to the approaching election. A large amount of business has been held up awaiting the result, and it is pretty generally believed that little except urgent business will develop in actual orders during the current month. While September did not show any material gain in the volume of business taken, no particularly heavy orders, unless from unexpected sources, are expected to come out in October. The trade, nevertheless, is decidedly optimistic in its views regarding business for the closing months of the year, and with the Presidential election out of the way it is thought that a steady forward movement will be noticeable, probably resulting in a return of conditions approaching the normal early next year.

Trade in the past week was rather irregular. Dealers report but a small volume of business, confined pretty generally to single tool propositions. There has been a somewhat more active demand for special machine tools, and several builders report orders more numerous during the closing days of last month. This is somewhat encouraging, as it means increased shop work in a number of cases, as many of these tools cannot, owing to their special nature, be carried in stock, as is the case with the standard lines of machine tools. In tools of the latter class shipments can be made almost at once, inasmuch as makers have been compelled during the dull summer months, to piece out shop work with stock orders so that their shop organization might not become broken up. During the current week local business will no doubt be considerably interrupted, owing to the celebration of Founders' Week, commemorating the two hundred and twenty-fifth anniversary of the founding of the city. The trade is interested to some extent in this celebration, particularly in that which will demonstrate the industrial growth of the city's manufacturing interests.

Railroad buying of machine tool equipment appears to be a matter of the future. The situation as far as the railroads are concerned appears to be steadily improving. Idle cars continue to show a steady decrease, which will ultimately bring more activity to car shops, which is a step toward buying of machinery equipment for replacement at least.

The foreign demand for tools of the usual standard types shows no betterment. Some little business of a special nature has come out, but inquiries on the whole are comparatively light.

The second-hand machinery trade is hardly as active as it was. There is a moderate run of business for medium and small metal and wood working machinery, but the trade also feels the depressing effect of the approaching election. A somewhat better demand is to be noted for boilers, both new and second-hand. This is largely confined to equipment of

the moderate powers ,of which several fair sales have recently been announced.

Slightly improved conditions are to be noted in the foundry trade. The gain has not been large in any one direction, but foundrymen note an improved but still irregular demand. The bulk of the business taken in both iron and steel castings is largely for prompt shipment, although some scattered orders for tonnages covering several months' business are reported.

Bids will be opened October 19 by Truman West, Mayor of Oakland, Md., for the construction of a sewerage system and municipal water works, from plans by Penniman & Fairley, engineers, 411 Marine Bank Building, Baltimore, Md.

The Interstate Railways, operating some 450 miles of electric railroads in eastern Pennsylvania, contemplates a number of improvements and extensions in the near future. These include a new power plant of 20,000 kw. capacity, at Reading, and a new electric line from Reading to Hamburg.

Proposals for supplies for the Philadelphia navy yard will be received by the Bureau of Supplies and Accounts, Washington, D. C., which include, under schedule 383, flat cars; schedule 389, watchmen's clocks, and schedule 410, rolled and manganese bronze. Bids will be received until October 13.

The House of Refuge for Girls, Darlington, Delaware County, Pa., has had plans prepared for a new power house, 40 x 76 ft. Bids will be received at an early date, but particulars are not available at this time.

The authorization by City Councils of Philadelphia of an appropriation of $1,500,000 for improvements on the river front will enable the Department of Docks and Ferries to carry out its plans relative to the building of modern docks at Dock street and Vine street, on the Delaware River. Appropriations covering bridge building, extension of gas works at Holmesburg and other municipal improvements were also made.

T. P. Conard & Co. report a slight betterment in the demand for boilers and power equipment. They recently booked an order for four 150 hp. Maxim water tube boilers, to be installed at the Hundington Street Station for the Philadelphia & Reading Railroad. Another order was for 600 hp. installation of Maxim water tube boilers for the West End Coal Company, Scranton, Pa., which, together with its underlying interests, now has 17 of these boilers in service.

The Espen-Lucas Machine Works reports an increase in the volume of business taken, particularly during the closing weeks of September. Last month was not especially good as far as shipments were concerned, but with orders taken recently the deliveries during the current month promise to be much heavier. Some pretty fair business is being figured on.

Several municipal departments are asking bids on both general supplies and new work. On October 15, the Department of Supplies, J. H. Klemmer, director, will open bids under class H, for hardware and tools, boat supplies, lanterns, &c.; class N, asbestos and magnesia covering, plumbing supplies, &c.; class Z, tin, sheet, and galvanized iron, hoop iron, zinc, lead bars, &c.; and under class AA, for engineers' and draftsmen's supplies. The Department of Public Works will also open bids October 14 for bridges, branch sewers and inlets, &c. Plans and specifications regarding the latter may be obtained from the office of the Bureau of Surveys, City Hall, while specifications for the former may be seen at the office of the Director of Supplies, room 312, City Hall.

Government Purchases.

WASHINGTON, D. C., October 6, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 27 for a bolt cutter, floor grinder, 72-in. lathe, and a shaper for the Norfolk Navy Yard.

The Isthmian Canal Commission will receive bids until October 26, Circular No. 472, for a piston pump, plate straightening machine, generators and engines and other supplies.

The date of opening bids for four berm and four chamber cranes for the Isthmian Canal Commission, Circular No. 467, has been postponed from October 7 to October 17.

The Department of Justice will receive bids until October 26 at the office of the superintendent of prisons, Washington, D. C., for brine pumps, tanks, coils and other equipment to be used in extending the refrigerating plant at Leavenworth, Kan.

The Isthmian Canal Commission will soon ask bids for three 3-ton and two 5-ton pneumatic geared hoists, six 1½-ton, six 2-ton, six 3-ton and six ½-ton differential chain hoists, one combined hand power pipe threading and cutting machine for 4 to 12 in. pipe, one geared shaper, one motor driven grinder, 80 electric drills, three band saws and eight ball bearing planer jacks.

The following bids were opened September 24, Circular No. 464, for class 3, four Scotch marine boilers for the Isthmian Canal Commission:

Bidder 30, Casey-Hedges Company, Chattanooga, Tenn., $21,900; 43, P. Delany & Co., Newburgh, N. Y., $17,550; 59, G. & W. Mfg. Company, New York, $14,440; 64, A. D. Granger Company, New York, $13,916; 72, Harlan & Hollingsworth Corporation, Wilmington, Del., $16,250; 84, Lake Erie Boiler Works, Buffalo, N. Y., $16,500; 89, Manning, Maxwell & Moore, New York, $13,590; 90, Marine Boiler Works Company, Toledo, Ohio, $13,960; 92, Maryland Steel Company, Sparrow's Point, Md., $15,960; 101, J. P. Morris Company, Philadelphia, Pa., $18,000; 111, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $16,624; 114, New York Shipbuilding Company, Camden, N. J., $15,975; 129, Pusey & Jones Co., Wilmington, Del., $15,000; 135, Roberts Safety Water Tube Boiler Company, Red Bank, N. J., $14,000; 144, Samuel Smith & Son Company, Paterson, N. J., $20,400; 149, Springfield Boiler & Mfg. Company, Springfield, Ill., $11,964.

The following bids were opened September 29 for machinery for the navy yards:

Class 1.—One engine, generator and switchboard—Bidder 30, D'Olier Engineering Company, Philadelphia, Pa., $4250; 50, A. D. Granger Company, New York, $3497, $3618, $3622 and $3650; 60, Henshaw, Bulkley & Co., San Francisco, Cal., $3350 and $3500; 75, Charles C. Moore & Co., San Francisco, Cal., $3681 and $3782; 107, Risdon Iron Works, San Francisco, Cal., $3450; 142, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $3984.

Class 11.—One shaper—Bidder 28, Compressed Air Machinery Company, San Francisco, Cal., $792; 59, Harron, Ricard & McCone, San Francisco, Cal., $766.70, $963.60, $882.30 and $735.70; 60, Henshaw, Bulkley & Co., San Francisco, Cal., $1030; 80, Manning, Maxwell & Moore, New York, $858; 99, Pacific Tool & Supply Company, San Francisco, Cal., $750 and $762.50.

Class 51.—One power feed drill press—Bidder 20, James Clark, Jr., Company, Louisville, Ky., $378.50; 42, Frevert Machinery Company, New York, $422; 56, Hamilton Machine Tool Company, Hamilton, Ohio, $384; 60, Henshaw, Bulkley & Co., San Francisco, Cal., $527; 80, Manning, Maxwell & Moore, New York, $495; 99, Pacific Tool & Supply Company, San Francisco, Cal., $298.

Bids were opened at the office of the Isthmian Canal Commission September 28, Circular No. 465, for delivery at either Colon or Cristobal and the delivery and erection at Gatun, Isthmus of Panama, of the plant and materials necessary to equip an electric industrial railroad consisting of 15,600 ft. of trackage, with 12 electric locomotives and 24 flat cars:

Item 1, 15,600 ft. trackage, installed complete; 2, 12 electric locomotives; 3, 24 flat cars; 4, total as specified; 5, electric locomotives; 6, flat cars; 7, current rail, straight; 8, do. curve; 9, frogs; 10, switchstands; 11, switch points; 12, straight track, with fittings; 13, insulators; 14, rail bonds; 15, protecting covers.

Items 5 to 15 inclusive are for additional equipment as covered by the specifications. Items marked A are in accordance with clause marked A of paragraph 8 for delivery with original order. Items marked B are for additional material ordered within one year in accordance with clause B of paragraph B.

Burnham, Williams & Co., Philadelphia, Pa., item 3, $1284.

Ducas & Co., New York, item 2, in accordance with own specifications for furnishing 12 gasoline or alcohol locomotives, $59,880.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., item 1, $26,328; 2, $24,966; 3, $10,936; 4, $62,330. Own make of locomotives; maker of cars, Atlas Car Mfg. Company. Item 5-A, $2080; B, $2050; 6-A, $456; B, $472.50; 7-A, 34c.; B, 29c.; 8-A, 37c.; B, 37c.; 9-A, $12.65; B, $12; 10-A, $13.33; B, $12.60; 11-A, $14.44; B, $13.65; 12-A, 66c.; B, 60c.; 13-A, $1.46; B, $1.26; 14-A, 60c.; B, 34c.; 15-A, 30c.; B, 23c. As an alternative we offer our 5½-ton locomotives equipped with two No. 31 550-V motors and K-10 controllers. If the locomotives of the above type meet the requirements a deduction of $4024 may be made from the price quoted. As an alternative to the cars mentioned on the face of our bid we offer cars as manufactured by the Gregg Company, Ltd. Should such cars be acceptable a deduction of $525 can be made from the price quoted. If an overrunning type of shoe is permissible and will meet all requirements of the service a deduction of $677 can be made from the price quoted.

Youngstown Car Mfg. Company, Youngstown, Ohio, item 1, $33,512; 2, $24,000; 3, $7,680; 4, $65,192. Own make of flat cars; for third rail, Lackawanna Steel Company; for track rails, Carnegie Steel Company; for frogs, switches, &c., Buda Foundry & Mfg. Company; for electric locomotives, Jeffrey Mfg. Company. Item 5-A, none; B, $2200; 6-A, none; B, $350.

Atlas Car & Mfg. Company, Cleveland, Ohio, bid A, item 1, $18,096.16; 2, $22,710; 3, $10,176; 4, $50,872.16. Own make of cars; electric equipment, Westinghouse Electric & Mfg. Company and Baldwin Locomotive Works for locomotive frames. Item 5-A, $1892.50; B, $2000; 6-A, $424; B, $450. Bid B, item 1, $18,096; 2, $25,881.24; 3, $10,176; 4, $54,153.40. Own make of cars; electric equipment, Westinghouse Electric & Mfg. Company and Baldwin Locomotive Works for locomotive frames. Item 5-A, $2156; B, $2300; 6-A, $424; B, $450. Bid C, item 1, $18,096.16; 2, $20,100; 3, $10,176; 4, $48,372.16. Own make of cars and locomotive frames; electric equipment, General Electric Company. Item 5-A, $1675; B, $1875; 6-A, $424; B, $450.

Wonham-Magor Engineering Works, New York, item 1, $24,562; 2, $24,939; 3, $8256; 4, $57,757. Own make of cars; electric locomotives, General Electric Company; rails, Carnegie Steel Company, Cambria Steel Works and Lackawanna Steel Company. Item 5-A, $2100; B, $2250; 6-A, $352; B, $358.

The following bids were opened at the office of the Isthmian Canal Commission September 28, Circular No. 469, for three 20-ton locomotive coaling cranes:

American Hoist & Derrick Company, St. Paul, Minn., $21,414; Browning Engineering Company, Cleveland, Ohio, $21,900; Brown Hoisting Machine Company, Cleveland, Ohio, $23,373; Interstate Engineering Company, Bedford, Ohio, bid A, $17,400; B, $19,800; C, $20,100; D, $22,500; McMyler Mfg. Company, Cleveland, Ohio, $30,750.

The following bids were opened on September 30 by the

quartermaster, Takoma substation, Washington, D. C., for an air compressor for Fort Washington, Md.:

Sullivan Machinery Company, Chicago, Ill., $1900; F. C. Boax, Philadelphia, Pa., $2290; Jos. L. Sweigerd Company, Philadelphia, Pa., $2915; alternate, $2180.

Bids were opened September 30 by the Superintendent of the United States Capitol Building and Grounds for fans, electric motors and steam heaters, for the ventilation of the United States Senate Office Building, as follows:

McCay Engineering Company, Baltimore, Md., item 1, in accordance with specifications, $19,945; item 2, using 1-in. heater coils and 10-in. pipe, $19,445. B. F. Sturtevant Company, Hyde Park, Mass., $13,985.50; Diehl Mfg. Company, Elizabethport, N. J., $17,980; National Electrical Supply Company, Washington, D. C., $17,705; New York Blower Company, Chicago, Ill., $16,736; Green Fuel Economizer Company, Matteawan, N. Y., $19,975.

Under bids opened September 8 for machinery for the navy yards, the Brown & Sharpe Mfg. Company, Providence, R. I., has been awarded class 151, one universal milling machine, $1149.50.

The following awards have been made for machinery for the navy yards, bids for which were opened September 15:

Cleveland Crane & Car Company, Wickliffe, Ohio, class 51, one electric traveling crane, $2445.

Motley, Green & Co., New York, class 121, two pattern-makers' lathes, $250.

Trade Publications.

Rolling Mill Machinery.—United Engineering & Foundry Company, Pittsburgh, Pa. Catalogue. Size, 8½ x 10 in.; pages, 397. Cloth binding. This volume is the general catalogue of what is reputed to be the largest manufacturer of rolls and rolling mill machinery in the world, being the consolidation of the Lloyd Booth Company, Frank-Kneeland Machine Company, Lincoln Foundry Company, McGill & Co., and the Chilled Roll Foundry Company. Beyond a short introduction and brief descriptions of the company's various classes of machinery, the book is mainly an album giving views outside and inside the various plants operated by the company and notable plants in which it has installed machinery, followed by illustrations of products, including rolling mills, roller tables, manipulators, hydraulic shears, intensifiers, plate shears, bloom and slab shears, squaring shears, doubling shears, lever shears, vertical shears and punches, rail straightening machines, horizontal beam straightening machines, hot and cold metal saws, roll turning lathes, roller straightening machines, squeezers, accumulators, grinding pans, galvanizing machine, corrugating machine, hydraulic cranes, special machines, cars, rail cambering machines, tube works machinery, pipe crushing and shearing machines, and steel castings and gears.

Lathes, Punches and Shears.—Young Machine & Tool Company, Gardiner and Taintor streets, Worcester, Mass. Pamphlet. Covers a line of iron working machinery, including engine lathes of 10, 12 and 14 in. swings; and a 10-in. foot power machine, a gear cutting attachment for engine lathes, a combined punch and shear furnished in four sizes, ranging from 8½ to 10 in. length of blades with punching capacity from ⅝ to 9-16 in. of plate iron; geared shears built in eight sizes, length of blades ranging from 3 to 10 in., with cutting capacity of from ⅛ to 9-16 in. of plate iron; geared punches in eight sizes from 1 to 2 in. diameter of die, 2½ to 11¼ in. depth of throat, with capacity from ⅛ x ⅛ in. to 9-16 x 9-16 in. in plate iron, and hand shears and hand punches.

Engines.—American Engine Company, Bound Brook, N. J. A political atlas, giving the platforms of the principal parties and portraits of the candidates of the Presidential campaign. Attention is called to the American-Ball Angle compound engine, which is shown on the back cover of the atlas, of which a full description may be had in the company's bulletin No. 14.

Cold Drawn Materials.—Pittsburgh Tool Steel Wire Company, Monaca, Pa. Booklet. Lists the various sizes of Monaca drill rods (round and square), Champion drill rods, alloy steel wire and rods, crucible steel wire, steel wire, and refers also to Monaca needle wire, cold drawn tool steel, drawn steel rods and dental steel. Tables of useful information are also given.

Crushing Machinery.—George V. Cresson Company, Philadelphia and New York (90 West street). Catalogue No. 5, 6 x 9 in., 72 pages. Buchanan rock and ore breakers, crushing rolls and mechanical separators are shown, with concise descriptions. Sectional views of the crushers, rolls and separators are given, and special crushers, such as plaster crushers, and sectional machines adapted for mule-back transportation are illustrated.

Mechanical Stokers.—Wetzel Mechanical Stoker Company, Trenton, N. J. Catalogue, 6¼ x 9¼ in., 30 pages. Describes the Wetzel mechanical stoker with the aid of illustrations and line drawings, and contains a general description of the functions of a mechanical stoker and its essential characteristics. This stoker was described in *The Iron Age*, September 17, 1908, in connection with an account of a boiler test in which the efficiency of the stoker was demonstrated.

PERSONAL.

W. A. Keirn, former purchasing agent of the Mesta Machine Company, Pittsburgh, has been placed in charge of the company's publicity department, succeeding R. D. Day, who has been transferred to its New York office.

J. D. Edmonds, who for a number of years has been engaged with the Western Electric Company, Chicago, both in sales and operating departments, has resigned this connection to accept a position as superintendent of works with the Sterling Electric Company, Lafayette, Ind.

William Lodge, president of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, has returned after several weeks' absence in Europe.

C. R. Robinson has resigned as sales agent of the Inland Steel Company of Chicago, to accept the position of Chicago representative of the Lackawanna Steel Company, with the title of district sales agent. His offices are in the Commercial National Bank Building, rooms 1726-1728.

Sir William T. Lewis, the new president of the Iron and Steel Institute, has been for some years a vice-president of the institute. He is a member of the Council of Civil Engineers, vice-president of the Institute of Mechanical Engineers and past president of the Mining Association of Great Britain, and of the South Wales Institute of Engineers. He served his apprenticeship at Merthyr Tydfil, the Welsh home of the iron trade, between 1850 and 1855. He has been prominently connected with blast furnaces, steel works, tin plate works and with important coal mining operations. He was a prime mover in the organization of the Monmouthshire and South Wales Coal Association, and led in devising the sliding scale arrangement for the settlement of wage questions at the South Wales collieries.

Horace S. Wilkinson has been elected president of the Halcomb Steel Company to succeed C. H. Halcomb. Dr. John A. Mathews, for six years metallurgist and assistant manager of the Sanderson Bros. Steel Company, will continue in full charge of the manufacturing departments of the Halcomb Company as operating manager and general superintendent.

J. A. J. Shultz, president of the Shultz Belting Company, has been elected president of the Missouri Manufacturers' Association, having headquarters in St. Louis.

Harry Pennington, Lumbermen's National Bank Building, Houston, Texas, has been appointed Texas agent for the Wheeler Condenser & Engineering Company, Carteret, N. J. He has been engaged in the practice of mechanical engineering in Houston for a number of years, and is at present consulting engineer for the Galveston Water Works, engineer for Houston and Fort Bend counties, president of the Southwestern Engineers' and Architects' clubs, and chief engineer officer of the State of Texas.

Peter Eyermann, metallurgical engineer, of Du Bois, Pa., has just returned from a brief visit to Austria.

Francis W. Hoadley, in former years associated with the office management of the American Society of Mechanical Engineers, has been recently elected secretary and treasurer of the Cassier Magazine Company, New York.

D. B. Meacham of Rogers, Brown & Co., Cincinnati, has returned from a prolonged European trip.

H. A. Brown, who has been connected with the Crucible Steel Company of America, as sales manager at its Philadelphia branch office for a long term of years, has been appointed assistant to the general sales agent of the company, with headquarters in Pittsburgh, Pa. He has been succeeded in the Philadelphia office by F. W. Evleth, who has been connected with that office as salesman for several years.

The Sabraton plant of the American Sheet & Tin Plate Company, at Morgantown, W. Va., which was shut down three weeks ago for lack of water, was put in operation October 5. The plant contains 10 hot mills and 12 cold mills, the product being black plate for tinning, and the capacity is about 2000 tons per month.

HARDWARE

BUSINESS men who have a direct interest in the matter of freights must not lose sight of the fact that the State and national governments have the right, within somewhat undefined limits, to regulate and control the business of the railroads. Merchants and manufacturers should accordingly be familiar with the manner in which this authority has been exercised, and especially with the laws which have direct and practical bearing on the transportation of merchandise. Such legislative action, whether taken by legislative bodies or indirectly through duly appointed commissions, has in many cases an immediate and definite bearing on the privileges of shippers and consignees, announcing general principles, determining rates, establishing rules and regulations relating to transportation, in accordance with which the business must be conducted. It is obviously important for those prominently identified with enterprises, and especially for managers, to be familiar with what has been done along these lines.

This is a subject to which business men should give more attention than heretofore, with a view to exerting their influence to discourage unwise measures and to secure the adoption of a policy which will be consistent with the public welfare broadly viewed, and thus to promote commercial interests directly and indirectly. Of the recklessness of legislators and their tendency to enact without due consideration unnecessary and in some cases mischievous laws, there have been many illustrations within the past few years. The story of legislation in regard to the railroads, as briefly told in another column by one who is exceptionally well informed in such matters, furnishes examples of mingled wise and unwise action, though taken generally with an earnest purpose to correct abuses, to maintain the rights of business men and to promote the public welfare. In this endeavor it is only too obvious that many mistakes have been made and many crude and ill considered laws enacted. This is largely the case, because the leading part in these efforts at reform has been left to the politicians, who have only a limited familiarity with practical business affairs and who are subject to constant temptation to curry favor with the masses of their constituents who are usually best pleased with the most extreme and radical measures. The fact is that business men all too generally have held aloof and have refrained from considering in a broad minded way these questions in which they pre-eminently are interested.

There is no doubt that recent events have impressed on the commercial classes the danger there is in unwise legislation, a lesson too which the law makers are apparently learning, inasmuch as during the present year there has been a halt in legislative interference in business matters. It may be put down as settled that the railroads and other great corporations are hereafter to be under a control or supervision to which they have not until recently been subjected. There is, obviously, pronounced need that such control or supervision be wisely exercised within limits which will permit rather than hinder enterprise on their part and enable them to do a profitable business while better serving the public. How to do this is a problem to which the business men of the country must give most careful consideration, and in regard to which they must be able to make their influence felt in their communities and in the halls of legislation. In these efforts too, the many trade associations should have part. There is an opportunity here for fruitful and suggestive discussion, for organized inquiry and work, and for deliverances that will have influence in forming a correct public opinion and aid in securing the enactment of wise laws.

Condition of Trade.

Trade continues to move along pretty steadily at its somewhat moderate pace. There would doubtless be less complaint in regard to the volume of business if it were not compared with the period of exceptional activity which terminated nearly a year ago. Manufacturers who were then under heavy pressure and unable to execute orders as promptly as the trade desired, feel more than the merchants do the changed condition of things and the falling off in the demand, as they are in some cases running with reduced forces, and are able to make prompt shipments and even perhaps to put some goods into their warehouses. Whatever inconvenience this state of things may involve for the manufacturers it is a convenience for the merchants to be able to secure prompt execution of orders and thus be permitted to carry relatively small stocks. Of this privilege they are not, apparently, taking undue advantage, most of the leading houses having placed fair though not heavy stock orders. When the goods thus purchased are exhausted they find it, however, a matter of convenience to be able to sort up in comparatively small lots. As election day approaches the canvass appears to be warming up and politics undoubtedly interfere to a greater or less extent with business. Taken all in all, the business situation is gradually improving with a volume of trade and a general steadiness of prices which should be regarded as very satisfactory in view of all the circumstances. A conservative view of the market is given in the following advices from one of the largest Hardware manufacturers in the country, which probably represent the views of many students of the situation whose opinion is entitled to weight. There are, however, others who are more sanguine in regard to the outlook:

Business is a little better with us, and sufficiently improved so that we feel warranted in attempting to run our works full time. We are not full-handed, and we do not believe that business has been thoroughly reconstructed. We do not know what political moves will be made in the name of business by either of the prominent parties to catch votes, but anything done that is of any importance will necessarily affect business and make people conservative. We believe it is right for buyers at present to be conservative, and our experience leads us to conclude that they are, and this conservatism may, and probably will, lead to normal activity, but when that will arrive no one can foretell. Our experience leads us to the conclusion that after election, in other words, on the 4th of November, whatever is the result, all people will depart to their several occupations and labor earnestly for good results; and we have as a basis of the building up of business the enormous crop estimated at present values as of $8,500,000,000, much of which value will have to be marketed at lower prices if the wage earners of our own country are not fully employed, and if Germany and England continue in their attitude of depression. Most buyers at present think that prices are too high, and this leads to the present conservatism.

Chicago.

The recent sudden drop in temperature, which in some parts of the West and Northwest was accompanied by snowstorms and freezing weather, has given a decided impetus to the lagging movement of winter goods. Jobbers are being importuned to hurry shipments of Stove Board, Stove Pipe, Coal Hods, &c., on orders placed earlier in the season, and there is a liberal number of new orders coming in, all for rush shipment. In its aggregate volume business in these lines is not notably large, but the bunching of demands gives this section of the market an air of unusual activity. While this is a feature always incident in a greater or less degree to the fall trade, it is emphasized this season by the meagerness of stocks and the general unwillingness to extend purchases beyond the necessities of the hour. Fortunately, the factories are in position to furnish goods, in this and most other lines, with reasonable dispatch, so that in the main dealers will not suffer the inconvenience of unusual delays. Developments in other directions have yielded nothing of marked interest respecting either demand or conditions affecting trade. On every hand are heard allusions to the political campaign as a disturbing factor, and the opinion is freely expressed that its unsettling influence will rest as an incubus upon the market until finally disposed of by the November elections. Meanwhile, it should be remembered that the wants of consumers are not diminished, nor their purchasing power curtailed by the academic discussion of questions of political economy, usually more terrifying in sound than effect. No change of notable importance is observed in the movement of heavy staples of Hardware, except that Corrugated Galvanized Sheets are in better demand, and mill prices on both Galvanized and Black Sheets are firmer. The tendency among mills to shade prices from $1 to $2 a ton is reported to be much less general than was the case a few weeks ago; we are advised, in fact, that even these moderate concessions are now obtainable from but few sources. A feature of demand in Metal Roofing is the increasing proportion of Galvanized Sheets used on buildings. Not many years ago the principal part of such tonnage was composed of painted Black Sheets, while the use of Galvanized was less general, being largely confined to heavy industrial and factory buildings. Now conditions are reversed, and the consumption of Galvanized Sheets in corrugated and other forms of roofing exceeds that of painted Sheets.

NOTES ON PRICES

Wire Nails.—Conservatism as to quantity of Nails ordered is still a feature of the market, as a large majority of orders received by the mills cover immediate needs. Stocks of Nails in the hands of both wholesale and retail merchants are estimated as being ususually small over the entire country. The quantity of Nails shipped by mills during September was a little less than for August, but was considered fairly satisfactory. Prices are well if not inflexibly maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00
Less than carloads to jobbers	2.00
Less than carloads to retail merchants	2.10

New York.—Local demand continues spasmodic, while requirements are usually confined to small quantities. Nails are quoted on the basis of $2.30 per keg in small lots at store.

Chicago.—After a brief period of hesitation due to prolonged drought, trade has quickened, and orders are coming in at a fairly satisfactory rate. Business for September, though short in tonnage of that for the corresponding month of last year, is practically even with August. Buyers continue to order goods as needed, and are asking for prompt shipment, more, perhaps, because such service is available than because of doubt of the future demand. Prices are reported to be firm and steady. Quotations are as follows: $2.13 in car lots to jobbers, and $2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New orders for Wire Nails entered by the mills in September showed a falling off as compared with August, but, as a whole, the month was fairly satisfactory. The large trade is still pursuing the policy of placing orders only for such quantities of Nails as are absolutely needed to fill current orders, and are not disposed to carry any larger stocks than are necessary for this purpose. We are advised that stocks of Wire Nails all over the country were probably never as low as they are at present, this being regarded one of the strong features of the situation. It is also true that new orders sent in are nearly always accompanied with the request for prompt shipment, which the mills are able to make. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

Galvanized Nails are quoted at $1 over the price of the regular Nails.

Cut Nails.—The market continues in about the same position that it has held for some time. The volume of business is comparatively meager, the large trade not being disposed to anticipate wants. Requests for prompt shipment are frequent. The general price is $1.80, base, per keg, f.o.b. Pittsburgh, but this price continues to be shaded to the large trade. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

New York.—In the local market demand for Steel Cut Nails continues to be for moderate quantities. Nails are held on the basis of $2.15 per keg for small lots at store.

Chicago.—Slight improvement is noted, but the acceleration of trade is slow and lacks the stimulation of vigorous demand. At the same time, while orders are principally for small lots, they are more numerous. The uniformity of rush shipping orders denote low stocks, and these are not being increased beyond the actual requirements of present demand. We quote Chicago prices as follows: In car lots to jobbers, Iron Cut Nails, $2.08; Steel Cut Nails, $1.98. In small lots from store: Iron Cut Nails, $2.25; Steel Cut Nails, $2.15.

Pittsburgh.—New orders being placed are almost entirely for small lots, the large trade not being disposed to buy ahead. The character of the orders being sent in on which prompt shipment is usually asked indicates that stocks held by jobbers are very low. The market is fairly strong, and it is claimed that with present costs of Steel, the margin of profit on Cut Nails is relatively small. The general market is $1.80, base, per keg, f.o.b. Pittsburgh, but $1.75 is made, on carloads and over. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

Barb Wire.—From sections of the country which have recently been favored with heavy rains, orders are being received by the mills in larger volume. Otherwise small orders for prompt shipment constitute the bulk of the business. Regular quotations are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Chicago.—An increasing number of orders which marked the opening days of October, are regarded as the beginning of a fairly satisfactory fall trade. It was feared that dry weather in the West would sensibly affect the fence trade, but recent rains have dispelled this doubt. The prospects for a reasonably satisfactory trade through October are considered encouraging. We are advised that prices are being well maintained. Quotations are as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car

lots, $2.25; Galvanized, $2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Some small orders are being placed for prompt shipment, but the amount of tonnage moving out from the mills is relatively small. Should the country be favored with some heavy rains, it is expected this would have the effect of causing more liberal buying for fall trade. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Plain Wire.—The larger part of the business received by mills is from fence manufacturers, and is generally for quite large quantities, while the wholesale trade is confining the size of orders to immediate requirements. Regular prices are reported as being well maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Some good sized contracts entered in the past few weeks indicate that fence manufacturers are beginning to anticipate wants which, in view of the prosperous crop conditions, they consider assured. This practice has, however, not extended to the rank and file of consumers, who are generally ordering supplies for immediate consumption and prompt shipment. September tonnage is equal to, but not much in excess of, the August business. Prices are said to be quite regularly maintained. We quote as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—Makers of Fence Wire and Fencing are now dating their orders about March 1 of next year, and this has resulted in more liberal buying and some large orders are being placed for delivery within the next two or three months. However, the large trade is not buying ahead to any extent, and is disposed to carry lighter stocks than usual at this season of the year. It is stated regular prices are maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

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Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Copper.—Bare Copper Wire, on October 5, was reduced ½ cent per pound base, to 14¾ cents, minimum car loads, f.o.b. works. Round Copper Rods and Rectangular Copper Bars, on October 1, declined ¼ cent per pound base, in lots of 1000 lb., to 16¼ and 17¼ cents per pound respectively. The reason given for the declines is that these lines were out of harmony with Ingot Copper, the Wire having been based on 14 cents Ingot.

Leather Belting.—The improvement in the market for Leather Belting, Lace Leather, &c., seems to be well maintained, and there is some increase in activity owing in part to the stimulating effect of recent advances and in part to the somewhat increased demand from mills and factories which are operating on a little more liberal basis.

Coil Screen Door Springs.—Prices on Coil Screen Door Springs, generally referred to in the trade as Perfection Springs, have suffered a severe decline. At the opening of the market a few weeks ago quotations were steady at about the level of last season, but weakness soon developed and the market is now upward of 25 per cent. lower.

Bright Wire Goods.—It does not appear that the market for Bright Wire Goods has stiffened appreciably. The attempt of the manufacturers to get the situation in hand referred to in our columns a week ago, seems to have been abortive.

Scythes.—As has previously been announced in these columns, the manufacturers' list prices on Scythes remain unchanged, but with an increase in the discount which makes a reduction of 50 cents per dozen from the prices which ruled during the past season. Different numbers and names are used by the various manufacturers, but the list prices on leading goods are as follows, subject to discounts as referred to below:

	Per doz.
Plain Grass Scythes, polished on cutting edge only	$8.00
Clipper Scythes, bronzed web	8.25
Solid Steel, web and backs polished	8.75
Grain Scythes, painted, cutting edge polished	10.00
Clipper Grain Scythes, bronzed web	10.25
Bush, Weed and Bramble Scythes, painted	8.25

The maximum discount from the above list will be allowed to merchants who specify on their contracts not later than December 1, 1908, but on orders specified after that date the discount is 25 cents per dozen less. Terms are 60 days net, or 2 per cent., 10 days, from March 1, 1909, on invoices prior to that date. An additional cash discount of 1 per cent. per month is offered on payments made prior to March 1. In view of the reduction to the larger trade, prices on small lots to retail merchants will naturally be somewhat lower than during the past year.

Rope.—The gradual improvement recently reported in the Rope business has not made any advance. Demand is not spirited, and carload orders are the exception. The number of grades of so-called Manila and Sisal Rope on the market is confusing, in so far as determining the real value. Manufacturers who turn out this class of goods claim that they are but meeting requirements of jobbers for low prices, which it is presumed retail merchants in turn demand. This condition is considered none the less unfortunate. General quotations for Rope 7-16 in. in diameter and larger are as follows: Pure Manila, 9 cents; Pure Sisal, 7 cents; No. 1 Jute, ¼ in. and up, 5½ cents; No. 2 Jute, ¼ in. and up, 5 cents.

Linseed Oil.—Since our report of last week on the Oil market, card prices have been reduced 1 cent per gallon by crushers. The market is not steady, however, at the reduced quotations, as a quite general price on State and Western Raw Oil, in five-barrel lots, is 41 cents, and 40 cents in carload lots. Demand is light and for small quantities. Quotations are as follows: State and Western Raw in small lots, 41 cents per gallon; City Raw, 43 to 44 cents, in small lots per gallon. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—During the early part of this week the Southern market was somewhat stronger, as the result of improved conditions. At present the receipts of Turpentine at Savannah have increased until they are in excess of demand, causing a slight reduction in price. Local demand is light. The New York market is represented by the following quotations: Oil Barrels, 37¾ to 38¼ cents; Machine Made Barrels, 38¼ to 38¾ cents per gallon.

Window Glass.—Conditions in Window Glass circles as reported last week have not materially changed. The organization of hand blown Glass manufacturers continues to claim the attention and energy of the committee, while the Glass workers are still engaged on a plan to increase their wages. Quite a number of Glass factories have gone into operation and others are preparing to start soon. It would seem that unless the manufacturers' organization is perfected so that production can be regulated and prices controlled, the future outlook for maintaining the making of Glass on a profitable basis will be discouraging. Demand for Glass has shown but a moderate increase, and unless there is a change in this direction, accumulating stocks at manufacturing points, to a greater or less extent, in the hands of concerns who must have cash to meet payrolls, will be a menace to the stability of the market. According to reports, the parties who have agreed to finance the manufacturers' organization will do so only when about 97 per cent. of the hand operators have signed the agreement. This is a herculean task for the committee working up the matter to accomplish. It is reported that regular quotations are not always strictly adhered to. It is

understood that manufacturers' discounts, for hand blown Glass, from manufacturers' list of January 1, 1901, are as follows: For A single and double strength Glass, 90 and 20 per cent.; for B single and double strength Glass, 90 and 25 per cent. Eastern jobbers' quotation from jobbers' list, October 1, 1903, for all sizes of single and double strength Glass, covering the territory east of Chicago, is 90 and 20 per cent. discount.

Trade Items.

THE PARTNERSHIP between Alfred Cole, Jr., and George Staiger, handling general Hardware and Mill and Factory Supplies, 32 Warren street, New York, expired October 1 by limitation. Alfred Cole, Jr., will continue the business without change in style.

BUTLER BROTHERS, Chicago and New York, in their catalogue of general merchandise for October, invite special attention to their fall sale of china. Other special offerings of interest to Hardware merchants are Japanese Goods, Tinware and Enameled Ware, Glassware, Woodenware, campaign goods, etc. More than 100 pages are also devoted to holiday lines. This monthly catalogue is referred to as a "book of profits," and helping the merchant to expand his offerings in goods that pay fancy profits over the retail counter.

THE NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., has issued its usual fall catalogue containing 320 pages, referring especially to lines which sell best at this season of the year. Particular attention is given to fall Sporting Goods and fancy lines, such as Lamps, Clocks, Silver Ware, &c., which are featured for the holiday trade. Space is also devoted to general lines, such as Kitchen Ware, Harness, Tools, Builders' Hardware, &c. On the inside cover of the catalogue is a map showing the location of the company's traveling salesmen in the United States.

As a medium of advertising his business Oscar L. Johnson, Rockville, Md., handling Builders' Hardware, Lumber, Cement, Lime, Roofing, &c., has lately issued a booklet containing a list of the English words, a modified spelling of which has been recommended by the Simplified Spelling Board, together with some interesting data on the subject. The booklet also on a cover page enumerates the Maryland legal holidays. Another pamphlet issued by Mr. Johnson is devoted especially to lumber, prices being given in connection with some lore on the subject.

THE October folder bulletin of the Wisconsin Retail Hardware Association is of the usual breezy character, with paragraphs which will be read with interest and pleasure by the members. Occupying a prominent place on the first page is the suggestion that it pays the merchant to get confidential with his clerks. The "Do It Now" and the "Do It To-morrow" clerks are also the subject of a pointed statement.

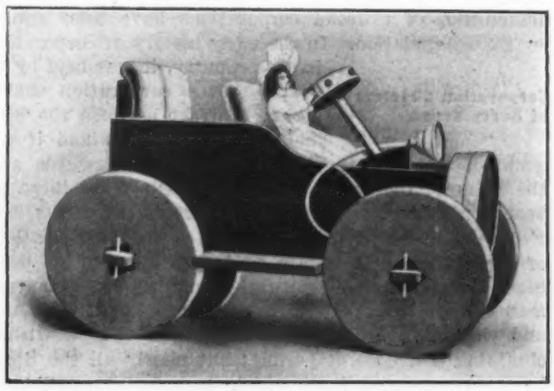
THE ROCKY HILL HARDWARE COMPANY, Rocky Hill, Conn., has been organized with the following officers: Frank E. Holmes, president; Henry G. Miller, secretary, and John A. Ellis, treasurer and assistant secretary. The company's manufactures, as shown in a catalogue of 24 pages, include Can Openers, Glass Cutters, Griddles, Hatchets, Hammers, Ice Awls, Chisels and Picks, Lemon Squeezers, Tack Pullers, Pliers, Towel and Clothes Racks, Suit and Clothes Hangers, Embroidery Specialties, &c.

The Murphy-Newcomb Hardware Company, La Jara, Colo., organized with a capital of $10,000, has purchased the stock, building and real estate of the B. L. Van Vechten Hardware Company. Business will be continued at the same location and in the same manner as heretofore, but the stock of Furniture and Vehicles will be practically doubled. The officers of the company are D. E. Newcomb, president; D. E. Newcomb, Jr., secretary; E. J. Murphy, treasurer.

G. W. Richey has purchased the business of Charles Swaine in Council Bluffs, Iowa, and will handle Shelf Hardware, Stoves, Tinware, Sporting and Athletic Goods.

A Hardware Automobile.

THE automobile here illustrated was made by J. S. Haigh and displayed in the Hardware store of Chas. Haigh, Fayetteville, N. C. It was put together with considerable ingenuity, being composed of Hardware articles not usually adapted to such a purpose. The wheels are made of Grindstones, and the body of planed boards. The front, corresponding with the radiator, is a Flour Sieve, the steering wheel is a Mouse Trap and the seats, &c., are made of Back Bands. An Oiler



A Hardware Automobile.

with the spout stuck in a rubber tube represents the horn, which, it may be assumed, was freely operated by the young woman chauffeur.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM VICTORIA HARDWARE COMPANY, Victoria, Texas, which has been incorporated with a capital stock of $20,000 to carry on a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, &c. The company has improved its store with new showcases and shelving.

FROM THE CASH HARDWARE COMPANY, Council Bluffs, Neb., which has succeeded to the business of Adam Lockner.

FROM THE CITY HARDWARE & FURNITURE COMPANY, Brooksville, Miss., which has been incorporated with capital of $7500, and will handle Shelf and Heavy Hardware, Stoves, Implements and Sporting Goods.

FROM THE LAFOUNT HARDWARE COMPANY, Logan, Utah, which has been incorporated with a capital of $25,000 to handle general Hardware, House Furnishings and Sporting Goods.

FROM QUAYLE-LARSEN COMPANY, incorporated with a capital stock of $50,000, which has recently started business in Duluth, Minn., making a specialty of Builders' Hardware, Cutlery and Tools.

The Schad Hardware stock in Wymore, Neb., has changed hands, and the business will be conducted under the style of the Wymore Hardware Company. The line handled includes Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods, Agricultural Implements and Buggies.

The Western Hardware Company has purchased the business of Robinson & McCrary, in Concordia, Kan., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting Goods, Harness, Saddles, Buggies and Queensware.

HARDWARE FREIGHTS.

State Regulation of Railroads.

WITH the unimportant exception of a small mileage of land grant roads built under charters from Congress over public lands, all the existing railroads in the United States have been constructed and operated under charters granted by the States. The right of eminent domain, the right to condemn private property for right of way purposes, and many other privileges and immunities of railroad corporations have been granted by State legislation.

Corporation Charters of Early Years.

In the early history of corporations in this country, it was held by the courts that a corporation charter was a contract between the State and the parties to whom it was granted, and that the State could not afterwards alter the terms of the contract; but in recent years there has been a marked tendency on the part of the courts, both Federal and State, to restrict and curtail the privileges of corporations. They are no longer allowed the broad constitutional rights of natural living persons. A natural man can go from New York to any State in the Union and engage in ordinary business as a citizen, without obtaining a license or permit; but nearly all the States have now enacted laws which exclude corporations of other States unless they obtain a license and comply with rigid regulations.

The railroads in recent years have felt the heavy hand of State regulation. Three years ago they made a great outcry through publicity bureaus against proposed National legislation that was pending in Congress, but not long after the pressure of State legislation became so severe that leading railroad men appealed to Washington for protection against the States. They found that the little finger of State power was thicker than the thigh of national regulation. Congress can only legislate on subjects pertaining strictly to interstate commerce, and national regulation has had the effect of increasing rather than restricting the revenues of railroads. The State, on the other hand, controls every branch of railroad operation and revenue, except interstate rates; and in the case of passenger revenue interstate fares have had to be reduced wherever the State has ordered reductions effective within its boundaries. The State can dictate the condition of roadbed and equipment that shall be maintained and order large expenditures; the speed at which trains shall run and the places where they shall stop; the rates charged for carrying passengers or freight; the conditions under which stock or bonds shall be issued, and practically every act of the railroad in which it can be shown that the public has an interest.

State Control of Railroads.

Restrictive legislation by the States began soon after the Civil War. In 1871 Illinois passed one of the first of the "granger" laws, creating a "railroad and warehouse commission," and providing penalties for discrimination in charges or service, or "extortion" in collecting excessive charges. In the same year Massachusetts enacted the first of a series of laws to prevent the issue of watered stocks or bonds. Two years later Illinois gave the State Commission the power to fix "maximum tariffs" for all the roads in the State. Iowa, Texas and other States followed the latter plan at an early date, and the "granger" method of regulation has been more generally followed ever since than the Massachusetts plan of merely regulating the issue of securities.

Beginning of Restrictive Legislation.

It is unfortunate that all the States have not followed some form of the Massachusetts plan. Railway capital once issued becomes in an indirect sense a public debt, because there is no legislative or judicial power in this country that can prevent a railway from collecting rates that will pay fair returns on its capitalization. Where the capital is limited to the money actually invested, rates and other questions of manage-

Plan Adopted by Massachusetts.

CONTENTS.

ment take care of themselves and require no legislation. Practically all the trouble between the public and the railways has grown out of the operations of a few "Napoleons" of finance, and down at the bottom of the question the people themselves are responsible for permitting these men to inject speculative ideas into railway management.

The "granger" plan of regulation grew out of the agitation in the West during the '70s against "middlemen." The "Grange," a secret society of farmers, spread over the West in those years and gained a large membership, as well as political influence. One of the doctrines that was widely accepted was the idea that all business men were "middlemen" or parasites who stood between the farmer on the soil and the workingman in the city and robbed both indiscriminately. The first mail order house that gained national prominence started through some connection with the Grange, and still advertises itself as a "grange supply house." The agitation against middlemen spent its force finally in laws to regulate the railways and fix their rates, as represented by the railroad commission laws of Illinois and Iowa. The United States Supreme Court sustained the power of the State to fix classifications and tariffs for the railroads through a commission, and the railroads submitted gracefully. In Illinois they have had no reason to complain, as the local maximum rates fixed by the State are higher than the rates voluntarily established by the railroads in Ohio and Indiana. Iowa, however, was pointed out for many years by railroad men as a State which had injured itself by pursuing an oppressive policy toward the railroads, which prevented them from encouraging the development of industries in that State. In recent years, however, the "Iowa idea" of strict regulation of rates through a commission elected by the people has become relatively conservative.

Railroad Commission Laws in Illinois and Iowa.

Texas was the first State to have what is now called a "strong" commission. Rates and classifications have been fixed with a strong hand, which has made the methods of Illinois and Iowa seem merciful by comparison. There have been no fortunes made by watering the stocks of Texas railroads, which have scarcely been permitted to collect revenues that would pay interest on the actual investment. The commission only concedes to the railroad the right to earn 4 per cent. on the actual value of its property, although many of the Texas roads had to pay 6 per cent. on their bonds in order to get money for the original construction, and the State authorized them in their charters to pay this rate. The commission has fixed what it considers a fair valuation of the railroads on which they should earn 4 per cent., but the State through its taxing power has fixed a much higher value per mile as the basis for taxation. Last year the Texas commission brought out a new line of State regulation by issuing an edict which prescribed the number of additional locomotives and cars which each railroad in the State should purchase. This is the most radical step that has been taken by any State, and the courts have not had the last word regarding it. Texas has carried on a strenuous struggle with the spirit of speculation, which has been one of the apparently necessary features of the development of the great Western empire.

Texas Regulates with a Strong Hand.

The Populist movement which began in the West 20 years ago and culminated in the '90s, did not add as much as might have been expected to the accumulation of railroad legislation. Kansas was at one time ready to enact a radical law reducing railroad rates, but a deadlock in the Legislature prevented action. In Nebraska such a law was passed, but it was declared unconstitutional by the United States Supreme Court on the ground that it would not leave the railroads sufficient revenue to pay returns on their investment.

Nebraska's Law Was Unconstitutional.

In the Granger period down to 1890, there was a general decline in the values of agricultural products, and widespread political unrest. During that time 22 States passed laws to regulate rates and fares, but with the exception of a few States they were generally of a mild character and aimed chiefly at fixing passenger fares. In the Populist period following 1890, the depression in agriculture became acute, but the railroads suffered to an equal degree, and only a few strong roads in the West escaped receivership. The courts were in no mood to accept radical legislation, and only four States in the period from 1890 to 1902 joined the list of those which regulated the charges of carriers.

Fixing Passenger Fares the Chief Object.

Since 1902, however, and especially in the years 1905 to 1907, there has been a remarkable development of State regulation. The weak commissions which were established during the grange period have been generally replaced by strong commissions, which have broad powers to fix rates and otherwise regulate railway affairs. In 22 States laws were enacted to reduce passenger fares, and only two of these laws, those of Pennsylvania and North Carolina, have thus far been declared unconstitutional by the United States Supreme Court. In nine States the legislatures have fixed freight rates by law, during this period, and nearly all the new State commissions have been given power to fix rates. The grange commissions were, with a few exceptions, merely ornamental bodies, designed to satisfy public opinion by the publication of statistics or by investigations and reports. The new policy, which extends over the most important States of the Union west of the Alleghanies, bears evidence of a grim determination on the part of the people to take an active part in the future in railway management. Thirty-nine States now have railroad commissions.

Regulation Has Been Rapid in Recent Years.

In New York the policy of the State has taken the form of a Public Service Commission, which has broader powers than any of the old granger commissions. New York railroads cannot issue bonds or stocks without the approval of the commission, which investigates the purpose for which the money is to be expended; and the commission also has broad powers to fix rates and otherwise regulate the policy and management of the carriers. The new Wisconsin commission has broad powers of the same character, and the new commissions of Oregon and Vermont control the issue of bonds and stocks. The older commissions of Georgia, Virginia and North Carolina have many of the powers of the modern "public utility commission"; and Oklahoma, the "baby" of the Union, has developed a strong policy in the control of all corporations which may wrest the banner of leadership from Texas.

New York State's Public Service Commission.

In the five years which preceded the panic last fall State legislatures had enacted some 800 new laws to regulate railways; and Congress brought forth the Hepburn law as its contribution to the new national policy. It is little wonder that financiers and large investors in railway securities became alarmed and tightened their purse strings, and there is little doubt that this wave of legislation had something to do with bringing on the panic. For nearly 40 years following the Civil War the people of the United States had, on the whole, pursued an indulgent policy toward railroads and other great business enterprises. The majority of the people believed that this policy helped to build up the country and make employment for the people, as well as a broader market for the products of the soil. The campaign of exposure which went on for several years in the magazines, the daily press and the various "investigations" conducted by National and State governments, brought on a reaction and a profound change in national policy under which corporations are to be held strictly to account in the exercise of the rights and privileges they hold.

Railway Regulation and the Panic.

SALES DEPARTMENT RECORDS.

BY SALES MANAGER.

A SELLING organization is not properly systematized if it does not build up an office record of details for the information of sales managers and proprietors, and to support the efforts of the salesmen. The importance of following up the work of the salesman is quite generally recognized, especially by houses whose lines are seasonable. Repeat orders are very much desired, but are frequently obtained by a competitor unless a persistent and properly organized follow up effort is made from the office.

Detailed Information Needed by the Office.

To make this effort most effective the sales manager must have as much information as can be obtained regarding the attitude of the merchant toward the house, his annual sales of various lines, his present stock, competing lines sold, and his reasons for preferring competitors' lines. Where a report from salesmen is required, experience has shown that the proper information is not regularly given unless a printed form is used. A short cut from

Printed Card Forms.

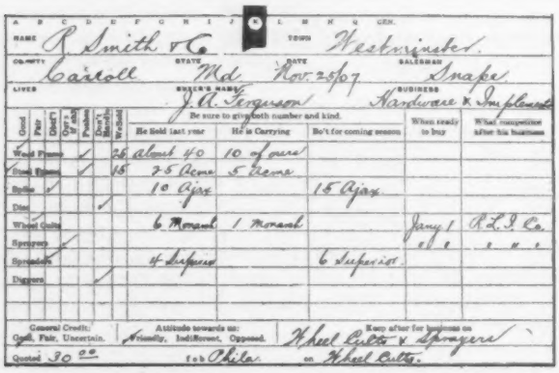


Fig. 1.—Salesman's Report Card as Filed in Office, with Metal Clip Indicating Line to Be Followed Up.

old methods is to supply salesmen with cards that can be filed in the office card cases without being rewritten.

Blanks Evolved by Experience.

The card illustrated in Fig. 1 is the result of some years' effort to bring the sales manager in unusually close touch with conditions existing with each merchant, and has been found eminently satisfactory. It prevents the haphazard report that omits information most desired; it compiles systematic data of the greatest value to the office, and it requires very little time or writing by the salesman. A record of the name of the merchant's buyer is important in case of the sales manager or a new traveler visiting the house. The margin at the left lists the important articles in the line, and provides columns to indicate by a check mark whether the merchant is a good, fair or doubtful prospect for the purchase of the lines checked. If the merchant pushes, or does not handle, certain lines, this information is given by check marks in the columns designated. The office is therefore in position to determine the most effective efforts necessary to stimulate the merchant and obtain the proper effort in the entire line. The last column in this margin shows what the merchant purchased the day the card was filled out.

Buyer's Name.

Lines Handled

Current Order.

Prospects for Future Sales.

The columns for sales the previous year and for stock on hand include competitors' lines, and show the volume of the merchant's business. This information, combined with the report of the merchant's purchases for the ensuing year, indicates in which articles the merchant probably could not be interested. The column, "When ready to buy," is self-explanatory and of great value. It enables the office to bring the matter definitely before the merchant at the most effective time, and is important for planning future visits of the salesman. The record of the competitors seeking the business decides the character of the effort that should be made to secure the order, and is information that is rarely reported by salesmen unless printed forms are used. This also gives information that is frequently used to advantage by the office at later periods. The reference to general credit is a constant reminder to the salesman that he is expected to be on the alert for any changes that may affect the credit of his old trade and make proper inquiries concerning new customers.

Record of Stock.

Time for Effort.

Competitors in the Field.

General Credit.

The Attitude of the Merchant.

A check mark indicating the attitude of the customer or prospect toward the seller is of chief importance when it is desirable to know which merchants would probably

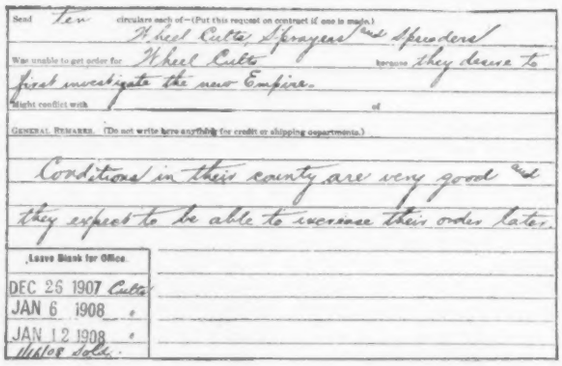


Fig. 2.—Reverse of Card, Giving General Remarks, Record of Office Work on Customer, &c.

give the best attention to the introduction of new lines. If the salesman checks "indifferent" or "opposed," the sales manager realizes that an effort must be made to gradually interest and enthuse the merchant or some other merchant be secured if possible. Often a merchant will manifest an interest in certain articles without placing an order. Notation is made on the card and the office attempts to increase this interest until an order is secured. A record of quotations is necessary where prices vary, because of quantity and other trade reasons.

Interest Manifested.

Clips on Cards to Be Followed Up.

The letters at the top of Fig. 1 are used to designate the various lines the house has for sale. If the salesman's report on the card shows that the merchant can probably be interested later in a certain line, a small metal clip is placed on the card at the letter representing that line, as K in the illustration. The card is then filed in the card case in any order that the requirements of the business make advisable. When the season for certain lines approaches, and it is desired to follow up the salesman's effort by individual or form letters, all cards referring to those lines can be quickly found in the card case by simply noting the location of the metal clip. The clip obviates the necessity of examining each card to learn if it contains reference to the lines desired at that time.

The Reverse of the Card.

The illustration, Fig. 2, is the reverse side of Fig. 1. A report of why an order could not be obtained is of value, notwithstanding this feature may be criticised as affording a means for salesmen to indulge in the too frequent habit of making excuses for failing to obtain results. The sales manager can usually detect the excuse. Frequently there are good and sufficient reasons for failing to secure an order, and if placed before the sales manager enables him to assist in overcoming the handicap. The notation regarding conflict with some other merchant is used for lines on which exclusive sale is given. The salesman is often in the best position to determine territory lines, and an entry at this part of the card acts as a guide for the office in not overlooking full pro-

Whys and Wherefores.

Local Competition.

tection to some nearby customer. Under general remarks is noted any special information or suggestion regarding matters pertaining to the sales department only. The blank space for the office is used for dates of mailing form letters, advertising matter, &c.

General Remarks.

System May Be Applied by Retailers.

As can be appreciated, a card of this character is applicable to the needs of manufacturers, jobbers or even retail merchants. By eliminating some of the detail the card could be used advantageously by all salesmen of the retail merchant, securing more efficient service from the salesman, and obtaining a definite plan for following up future prospects that would surely result in an increased business.

SOME FEATURES IN THE ESTABLISHMENT OF ROE & CONOVER.

THE city of Newark, N. J., is the natural center of a large and important manufacturing section. It is also the obvious distributing point for the metropolitan suburban district in New Jersey, which of late years has developed rapidly and with the establishment of the

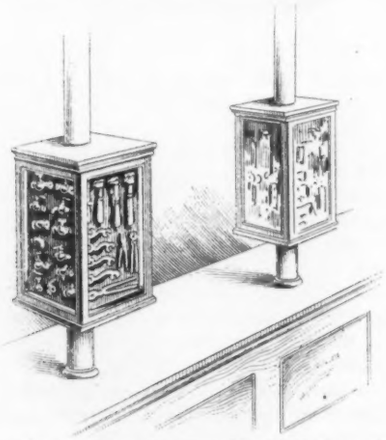


Fig. 1.—Display Cases for Samples Built Around Posts.

improved transportation facilities afforded by the North River tubes promises to grow still more rapidly in the near future. With a broadening market, business interests in Newark are expanding and far sighted merchants are making provision not only for present but for prospective requirements.

The jobbing Hardware and supply house of Roe & Conover is one which has recently found it necessary to

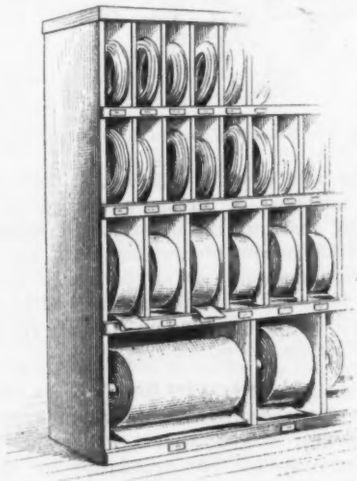


Fig. 2.—Gallery Accommodating Wire, Leather Belting and Sheet Packing.

enlarge its facilities, installing better methods of keeping and handling stock and making elaborate improvements in its salesroom. Galvanized steel shelf boxes with oak fronts have been put in in interchangeable sections, together with adjustable shelves and partitions to facilitate any rearrangement which may prove necessary from time to time. The effort is made to use all available space to best advantage, securing the greatest compactness with a minimum of possible confusion and disorder. A considerable economy in help is also effected because, since the stock requires less handling, fewer men are needed to keep it in shape, and it is all so clear-

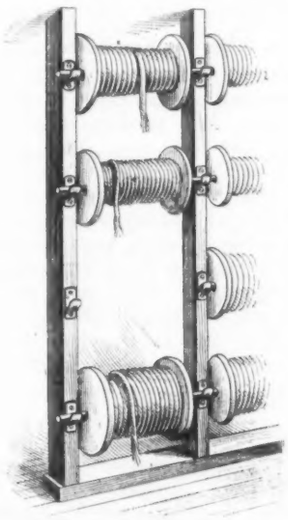


Fig. 3.—Method of Handling Wire Rope.

ly marked and simply arranged that even inexperienced clerks can wait on customers when necessary.

Showcases Around Posts.

A noteworthy feature is a series of display cases which are built on supporting posts. There is a line of these posts running with a counter the whole length of the salesroom and extending down through the middle of the counter to the floor. The cases are built square round each post as shown in Fig. 1, having glass sides and well finished oak frames to match the shelving and other fixtures. Each side presents a sample board covered with black cloth on which are displayed such lines as Brass Cocks and Bibbs, Wrenches, Machinists' Tools, &c.

Extensive Racks of Bins

are provided in a conveniently accessible place for the accommodation of Plumbers' Unions, L's, T's, &c. There are approximately 1200 of these bins, varying in size ac-

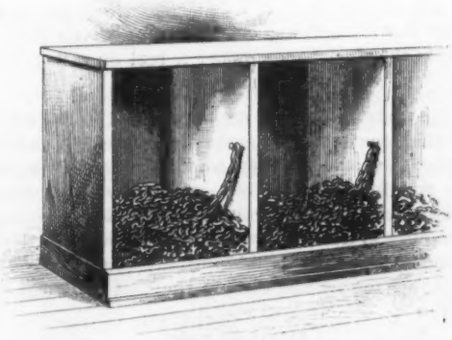


Fig. 4.—Bins of Chain with Ends Hung on Pegs.

cording to the quantity of stock which must be carried, the sections being interchangeable to facilitate rearrangement when necessary, and the individual bins provided with a card frame for marking, so that if it is desirable to change certain stock from one bin to another, larger or smaller, this can be done without difficulty. Similar convenient accommodations are provided for Bolts, Nuts, Lag and Machine Screws, &c.

Catalogue File.

A section of shelving is given up for a catalogue file, a feature of this deaprtment being that galvanized steel shelf boxes, such as are used to contain goods, are also

employed for the catalogues. This gives them a very substantial inclosure and greatly facilitates keeping the catalogues in good condition and file in order. Card frames on the outside of the boxes hold index labels, showing the contents, while further information may be written if desired on the side of the box, a portion of which is painted with yellow paint for pencil notes. These notes may be readily erased or corrected the same as if the pencil marks were made on paper.

Accommodation of Wire, Leather Belting and Sheet Packing.

A sort of gallery is fitted up for the accommodation of Wire, Leather Belting and Sheet Packing. It is found convenient to keep these products together as they are handled in much the same way. Beginning at the floor, partitions are constructed both horizontally and vertically extending to the ceiling, as shown in Fig. 2. In the upper tiers of compartments are kept coils of Wire, including all the varieties, sizes, &c., carried in stock. Labels on each bin indicate the kind and number of the Wire which it contains. When it is desired to fill an order the Wire may easily be unwound.

Below the Wire are similar but, of course, larger compartments containing Leather Belting. This is also

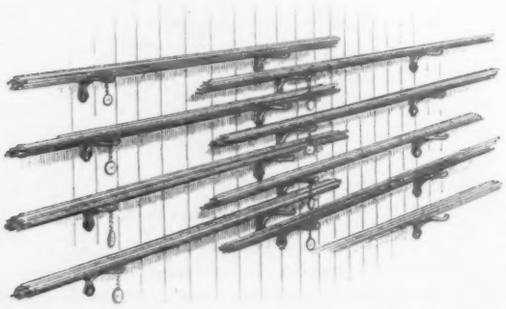


Fig. 5.—Stock of Bessemer Rods with Tags Giving Size in Decimals and Fractions of an Inch.

in coils which are unwound as the Belting is cut to order. Compartments are labeled in the manner already described.

At the bottom of this tier of compartments or gallery, as we have termed it, Sheet Packing is kept on reels, as indicated in the illustration.

Wire Rope.

A somewhat similar method is employed for keeping and handling Wire Rope, although this is stored in a different part of the building. A rack is constructed to accommodate reels, as shown in Fig. 3. The reels turn on an axis of bar iron, for which bearings are provided by heavy sockets screwed on the posts of the rack. Being double these sockets support a reel on either side.

A Practical Idea.

In the firm's method of handling Chain, which is kept on the floor in bins, a simple but practical and useful idea was observed. It often requires some little time to find the end in a lot of Chain, especially if for any reason it has been shoved around or handled much. This inconvenience is avoided by the homely but effective plan of driving a nail into the side of the chain bin (Fig. 4) and always hanging the end on the nail after the Chain has been cut.

Bessemer Rods.

A rack which is both convenient and economical of space serves for the accommodation of Bessemer Rods. This rack is constructed by putting up ordinary Harness Hooks, as shown in Fig. 5, two alternate rows of Hooks being formed in the center of the rack, so that they can be set close together. Brass Marking Tags are hung by small Chains from the ends of the Hooks to tell the size of the Rods. One side of the Tag is stamped with the wire gauge number and the other with the decimal equivalent so that it is easy to locate the Rod wanted whichever way it is ordered.

Steam Fittings.

The firm's method of accommodating and handling cast iron and malleable fittings recommends itself as decidedly efficient and original. As will be recognized by merchants stocking these goods there is a very large variety of sizes, shapes, &c., to be accommodated, and the

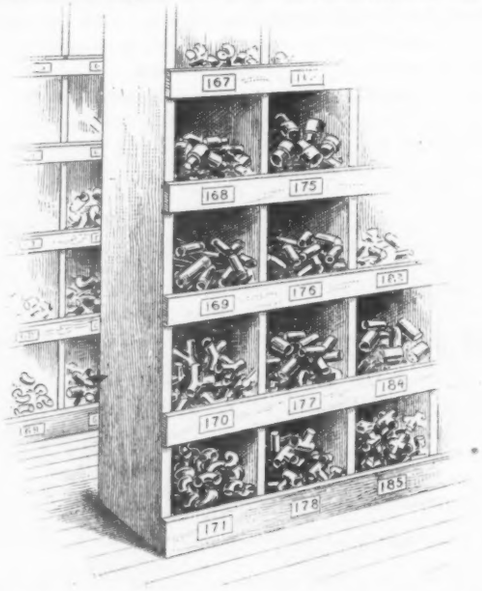


Fig. 6.—Section of Bins Containing Cast Iron and Malleable Fittings.

possibility of confusion as well as loss of time in hunting up and picking out exactly the piece wanted is very great. The firm keep all these goods in bins constructed on one of their upper floors—the number of bins required running up to quit a large figure. The bins are numbered consecutively, each bin number being prominently marked in front, where it can be seen in passing through the aisles (Fig. 6). Down on the first floor in the order department is kept an index showing exactly what article each bin contains. Thus, in filling orders, it is only necessary to send for number so-and-so, which even an inexperienced stock clerk can immediately pick out with

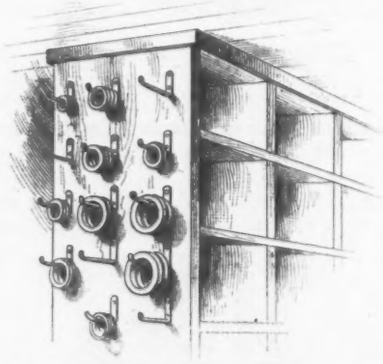


Fig. 7.—Gaskets Hung on Harness Hooks.

the aid of the number on the bin and without danger of making any mistake. A further advantage of this system is that by changing the index it is a simple matter to alter the arrangement of the stock if at any time this is found necessary on account of changes in quantities.

In Fig. 7 is shown a convenient method of accommodating Gaskets, which are hung on Harness Hooks affixed to the end of the section of shelving.

Lockers for Men.

In such a large establishment, where a good many men are employed, it is, of course, important to provide convenient and adequate accommodation for the hands. This problem the firm has effectively solved by giving up a certain amount of floor space for the construction of individual lockers. These are both commodious and sanitary, being long enough so that clothing will hang at full length and well ventilated so that working togs will dry out and air over night. The firm believe that they themselves benefit materially from this consideration for their employees.

Death of William Keuffel.

WILLIAM Keuffel, president and founder of the business of the Keuffel & Esser Company, died at his home October 1. Mr. Keuffel had been active in the affairs of the company until about two years ago, since which time, although in touch with what was being done, impaired health had prevented his old-time activities. He had been spending some time at his summer home at Elka Park, in the Catskills, of which association he was honorary president.

Mr. Keuffel was born at Walbeck, Germany, July 19, 1838, and was educated in the public and private schools of his native place. When fifteen years old he left school and was apprenticed in a general merchandise store, where he remained four years, receiving a severe but thorough mercantile and business training, which fitted him for the successful career of later years. He then entered the employ of a large Hardware house in Hanover, Germany, from where, several years later, he went

WILLIAM KEUFFEL.

to Birmingham, England. In 1866 he came to the United States, and in 1867, with his friend Hermann Esser, founded the firm of Keuffel & Esser. Drafting was then in its infancy in America, but Mr. Keuffel foresaw and appreciated its coming importance in connection with the phenomenal development of American manufacturing and engineering enterprise. To supply all the requirements in office and field of the surveyor, engineer, architect and draftsman and make a specialty of this business was the purpose of the new firm. Mr. Keuffel may well be called the pioneer in this important line, because previous to the establishment of his firm, drafting supplies had not been dealt in exclusively by any house in the United States.

The business started in a very small way, was successful from the beginning, and three years later the house published its first catalogue of Drawing and Surveying Instruments, which have become standard. Forty years of indefatigable labor and progress placed William Keuffel at the head of what is said to be the largest house in its field in existence. The factories in Hoboken, N. J., occupy portions of two large city squares, with room in both for future expansion, the brick and stone buildings now containing 5½ acres of floor space. There are unusual facilities for examining and testing critically the innumerable delicate instruments of precision manufactured by the company.

At the parent house, 127 Fulton street, New York, every requisite of the engineer, surveyor and draftsman may be found, and similar stores are maintained in Chicago, St. Louis and San Francisco. The high reputation of Keuffel & Esser products is recognized both at home and abroad. The business of the Keuffel & Esser Company, established by William Keuffel about 40 years ago, when he and his partner constituted the entire force, employs now about 1000 people. Mr. Keuffel's success in building up a business of such magnitude is attributed to his untiring energy, far-seeing comprehension of its necessities and possibilities, an indomitable will to surmount obstacles and a magnetic geniality and enthusiasm, coupled with an attractive personality, which had enabled him to procure the best efforts of the force working with and under him.

Mr. Keuffel was a resident of Hoboken almost from the time he arrived in America, and took great interest in public and social affairs both there and in New York City, belonging to many prominent organizations, although he never entered the political field. For years he was the president of the Hoboken Academy, a well-known German-American school, and later was much interested in the Manual Training School, of which he was a trustee for some years. He was also a member of the Advisory Board of the German Hospital. Mr. Keuffel is survived by a widow, one son, W. G. Keuffel, and three daughters, one of whom is Mrs. Carl M. Bernegau, wife of the company's treasurer.

Ohio Hardware Association.

THE Executive Committee of the Ohio Hardware Association met in Columbus on the 24th ultimo to make arrangements for the 1909 annual convention. The meeting was well attended, and much interest was manifested. It was decided to hold the next convention on February 23, 24 and 25, at Columbus. The executive sessions will be in the Board of Trade Auditorium, Memorial Hall being reserved for the Hardware exhibition, which has for several years been a notable feature of the annual gathering. During the next convention a special effort will be made to entertain the ladies who accompany the members to the meeting, and it is hoped to induce many to make the trip. The committee has decided to request manufacturers and jobbers exhibiting at the convention not to give out souvenirs, as it has been found in past conventions that the professional souvenir seeker interfered with the man who desired to make a study of the goods on display. Frank A. Bare, Mansfield, secretary of the association, will be pleased to send on request to those considering the desirability of exhibiting, a floor plan of Memorial Hall, together with isometric perspective, showing the universal booth in colors.

The Miller Bros. Cutlery Company's Catalogue.

THE MILLER BROTHERS CUTLERY CO., Meriden, Conn., has issued a substantially bound catalogue covering its extensive line of Pocket Cutlery. The book is profusely illustrated with the numbers and descriptions of goods directly under the illustrations, making it an easy matter for merchants to order what they want. Besides Pocket Knives, the catalogue refers to office and desk Knives, Ink Erasers, &c., which are manufactured by the company.

A CORPORATION known as the Lambert-Springer Company has been organized in Manila, P. I., to carry on a wholesale Hardware and Plumbing business. Besides a general line of Hardware and Plumbing and Sanitary Fixtures, the company will handle Stoves and Kitchen Furniture, Paints, Oils and Varnishes; Hose, Packings, Lubricating Oils and Engineers' Supplies. The company's quarters are at 83 Calle David. In this company Leon J. Lambert and Milton E. Springer, the latter until a few months since having been manager of the American Hardware & Plumbing Company, are associated.

T. V. MOORE has bought the Hardware business in Canisteo, N. Y., which has been conducted by W. P. Goff as agent for Irving D. Booth. Mr. Moore is an experienced Hardwareman and has been in business in Addison and Perry.

THE IRON AGE STANDARD HARDWARE LISTS.*

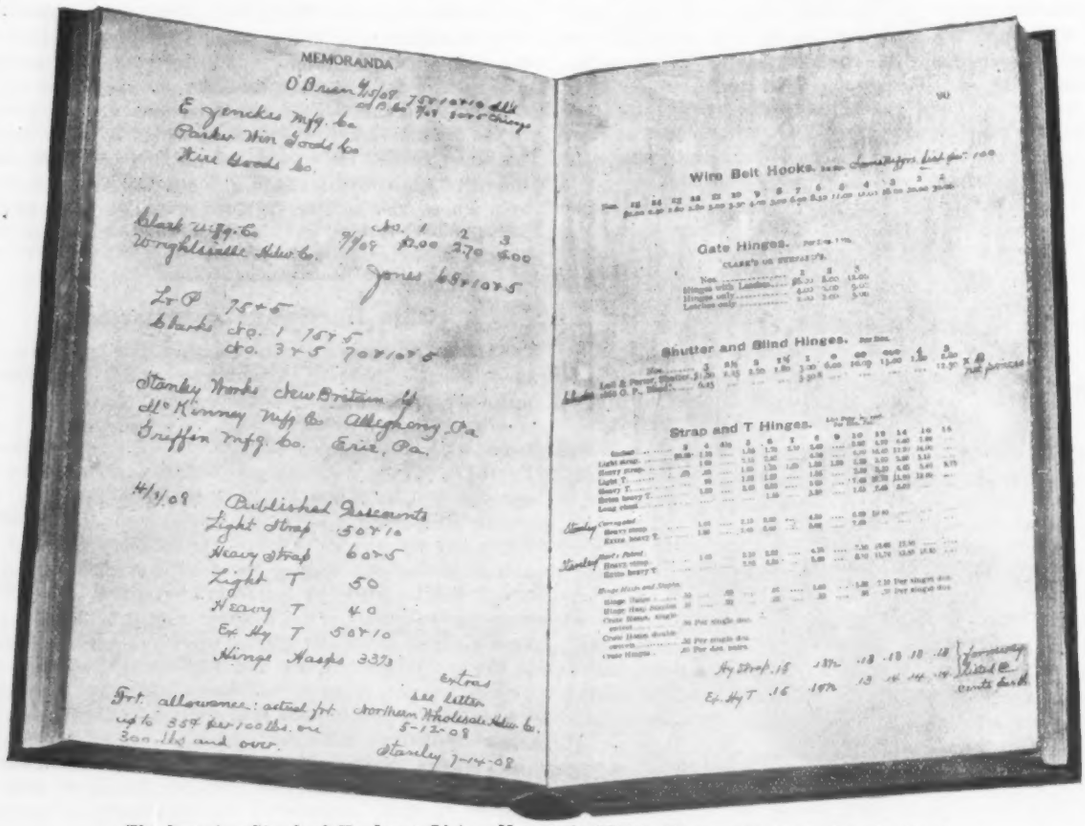
"THE Iron Age Standard Hardware Lists" has recently been issued in a new and improved form, revised to date. Instead of its former flexible cover the book now has a substantial and durable cloth binding.

It contains 218 printed pages of list prices, with an equal number of blank pages for memoranda, and includes upward of 300 standard price lists completely indexed and cross indexed. Some idea of the scope of the book and the care with which the index is compiled and cross headed may be gained from the portion of the index reproduced below:

* "The Iron Age Standard Hardware Lists," for Pocket, Desk or Price Book Use. Revised to date. Compiled by R. R. Williams, Hardware Editor of *The Iron Age*. Published by David Williams Company, 14-16 Park Place, New York. Price, $2.

As far as practicable the lists appear in alphabetical order under the recognized trade names of goods, a fact which will often enable the user to turn directly to what is wanted without reference to the index, especially after he has become somewhat familiar with the book.

The lists are printed in compact form, but the type is clear and the arrangement is studied to facilitate quick and convenient reference. Ample margins are left wherever feasible, affording space for additions, changes or other notations. Another important feature is that the lists are printed on only one side of the paper, appearing on the right hand page as the book is open. This



The Iron Age Standard Hardware Lists.—Manner in Which Memoranda Pages May Be Used.

makes it possible to cut out lists if desired for pasting on cards, drawers or shelves, in price books, &c. It also leaves a blank page for memoranda opposite every page of lists.

Blank Pages for Memoranda.

The principal object of the book is, of course, to afford one convenient place where all standard list prices may be referred to without taking the time and trouble to look up the printed matter of the manufacturers. By the use of the blank memorandum pages, however, it is possible to collect and keep track of much additional information of value, the character of which may be indicated by the following heads:

Alterations in lists due to changes, additions, &c., made by the manufacturers; new lists adopted; items on which net prices are frequently quoted, &c.

Special lists, not standard, in which the merchant may be interested, lists of individual manufacturers, &c.

Names of manufacturers;—with these may be included reference to jobbers and others from whom purchases may be made.

Quotations received, with reference to their date and source, whether manufacturer, jobber, agent, salesman, letter, &c.

Information regarding deliveries, freight, and the like.

Stock on hand at stated dates or regular intervals; maximum or minimum stock carried; character of the demand; quantities sold during the season or year, &c.

Any other notes or memoranda regarding the individual lists which merchant or buyer may desire to keep track of, entries in cipher, selling prices, buying or selling hints, reference to quality, dated reminders, &c.

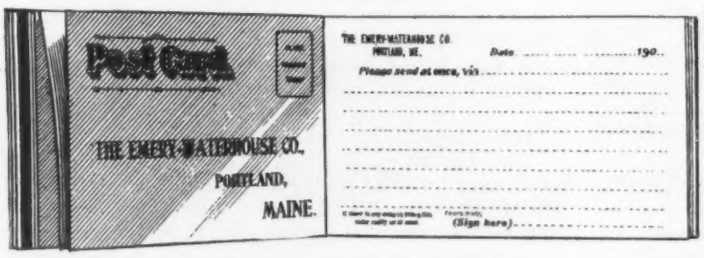
Practical Use of the Book.

By way of suggesting the practical use to which the book may be put, two facing pages are reproduced in the accompanying illustration with various lists, notes, quotations and emendations such as an intelligent merchant or careful buyer might find it convenient to make. This illustration is not intended to indicate the proper use of the book which would of course vary with the individual, but merely to show some ways in which the space may be employed. Opposite the price lists are the names of some of the manufacturers. Two quotations are given on Wire Belt Hooks, one from O'Brien, a salesman, and the other from the A. B. Company. The former is a delivered price and the latter f.o.b. Chicago. Two quotations are noted on Gate Hinges and Latches, one at net prices and the other from Jones quoting discounts. The regular base discounts on Strap and T-Hinges are entered up, with reference to certain letters quoting extras. On the printed page a note has been made that some manufacturers list Wire Belt Hooks by the hundred instead of by the thousand. There is a memorandum in regard to manufacturers of 1868 O. P. Blind Hinges, and that B. quotes net prices on these goods. There are also notes to the effect that Stanley Works are manufacturers of Corrugated and Hart's Pattern Strap and T-Hinges, and that previous to February 10, 1908, some sizes of Heavy Strap and Extra Heavy T-Hinges were listed at cents per pound instead of by the dozen.

These are but a few illustrations of the use to which the blank pages may be put in receiving annotations in regard to the goods named on the opposite pages, or in supplementing the list prices there given.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.



Emery-Waterhouse Company's Rush Order Book.

GOULDS MFG. COMPANY, Seneca Falls, N. Y.: Illustrated booklet describing and listing Combination and Universe House Force Pumps, Cistern and Pitcher Spout Pumps, &c.

DIAMOND SAW & STAMPING WORKS, Buffalo, N. Y.: Illustrated catalogue No. 14, referring to Sterling Hack Saw Blades and Frames, Power Machines, &c.

CARBURUNDUM COMPANY, Niagara Falls, N. Y.: Catalogue illustrating, describing and listing an extensive line of Sharpening Stones. The catalogue is attractive in appearance and especially well arranged with full descriptions of all goods.

ERIE SPECIALTY COMPANY, Erie, Pa.: Catalogue illustrating and describing a number of new specialties, including Cork Pullers, Lime Squeezers, Ice Picks, Crown Removers, Potato Mashers, Ice Cream Dishes, &c. The catalogue also contains lists of other goods manufactured by the company.

W. H. GIESELER, formerly a Hardware merchant of Brooklyn, N. Y., has moved to Denver, Colo., where he has opened an office at 1648 California street. He announces that he is prepared to handle anything in the Hardware line as manufacturers' agent.

Correspondence.

Patent Infringement Suits.

To the Editor: Would it be possible to have a law passed making it compulsory on patentees bringing suit for infringement to bring their action against the manufacturer himself instead of against the manufacturer's customers, and in case the patentee obtains judgment against the manufacturer that he must first try to collect his damages from the manufacturer before he attacks the manufacturer's customers?

As the law now stands a patentee with a very flimsy patent who has really no claim against another manufacturer can annoy the other manufacturer's customers and injure his trade by threatening his customers and bringing suits against them in various places.

Take for instance, a rich company which wishes to keep any one else from going into the same line of business and some man of moderate means has an article that he wishes to put on the market. The rich concern can go about bringing suits here and there against customers of this new competitor knowing that he will be financially unable to defend the suits. You will readily see how a small concern can be kept out of business in this way by a rich one which does not hesitate to spend thousands of dollars for the sake of keeping some one else out of the market.

OHIO.

The Emery-Waterhouse Company's Rush Order Book.

THE accompanying illustration shows a rush order book furnished to customers by the Emery-Waterhouse Company, Portland, Maine. It is designed to provide merchants with a convenient and time saving method of sending in small orders requiring prompt attention. At the same time it affords them a copy by which to keep track of such orders at their end. The book consists of a dozen unstamped post cards addressed to the company bound alternately with an equal number of white sheets, both ruled and printed, as shown in the illustration. Orders are written on the white sheet and copied by carbon paper on to the card, which has only to be torn out where perforated, stamped with a 1-cent stamp and mailed. The original on the white sheet remains in the book for future reference. Customers are assured that orders received in this way will be treated as rush, and are requested to send for books as needed. On the cover is the maxim, "Buy often; don't overstock." The idea has been used by the company for some time, and has proved a valuable and practical one. There is seldom a mail which does not bring orders in the writing of which this book has been used.

FOR particulars and sketches in regard to the unique airship illustrated in our last issue as a special feature of the house cleaning requisites window display made by A. M. Bell & Co., Halifax, N. S., we were indebted to S. S. Wetmore, one of the traveling salesmen of the house. Mr. Wetmore has been connected with the firm for many years, and is well known to the trade in his territory, which covers the southern coast of Newfoundland. Having unusual talent for window dressing, Mr. Wetmore has been called upon from time to time when off the road to get up displays for the store windows. In this he has been notably successful, and the displays have not only attracted much attention locally, but have secured for him many prizes in the way of medals and cash in competitions of this sort. At the recent Nova Scotia Provincial Exposition he prepared an elaborate exhibit for the firm which was awarded a gold medal for its originality and excellence of construction. Mr. Wetmore will discontinue his affiliation with A. M. Bell & Co. on January 1, and will then locate in New York city, where he expects to devote a good part of his time to work as a window display specialist.

Here and There in the Sales Department.

BY SAMUEL MASTERS.

III.—THE MANAGER MANAGED.

HARTMAN, JUNIOR, was a man of action. When he had decided to put me in the city store to establish certain reforms under the direction of the manager he was anxious to have the work begun. To ask Mr. Martin, the manager, to change his methods would be, as he knew from experience, to invite argument and antagonism. To propose that I be permitted to inaugurate a selling campaign along the line of Hartman, Junior's, ideas would cause a quarrel and an appeal to Hartman, Senior, (who would probably side with Martin), and would end in failure to accomplish anything. To achieve his purpose, the initiative must be taken by Mr. Martin.

The First Move in the Campaign.

The next morning Hartman, Junior, dropped into the visitor's chair beside Mr. Martin's desk for his usual chat regarding business. Martin showed him, with some elation, an order for a goodly quantity of Twist Drills at an unusually good price.

"That order, Mr. Hartman," said he, "was taken right here, and the other fellows didn't get a smell at it. If it had been taken at the buyers' desk it would have taken an extra 10 per cent. to land it, if we got it at all."

"It's a good order, Charley," said Hartman, Junior, "and I only wish we had more of them. I haven't a word of criticism to find with the business you get, but the time is approaching when the profits on your orders won't cover your expenses. Business everywhere is better this year than last—except right here. What orders you do get show a larger profit, but we must have more of 'em, Charley, and if you won't go after buyers there must be some means found to bring them to you. You might just as well face the music now as later, for Senior is getting uneasy, and it won't take many more months of diminishing sales to get him on your trail—and you know what he is liable to do."

Martin began an angry protest, but Hartman, Junior, cut him short.

If the Mountain Won't Come to Mahomet—

"Now, see here, Charley," said he, "there is no use in getting angry. I know that my ideas don't suit you and I am not going to urge them upon you. But if your methods are to win they must be enlarged. You want the large orders taken at your desk. Very well! The inquiries must be brought here if you are to do the business. The whole matter is strictly up to you, and Senior looks to you to make good. In his present frame of mind he will listen to anything reasonable in the way of aids to getting trade. Can't we ask him for another out-of-door salesman or two?"

Martin "didn't want any more salesmen to knife profits for him. His two men were in constant touch with the principal buyers now."

"But how about the smaller firms?" asked Hartman, Junior. "Those are the fellows that pay good profits, because there is less competition for their orders. Can't you get after them?"

"No," said Martin, "I can't. The business is too small to make it pay unless it comes in without expense in its getting. Besides, the credit manager won't pass half their names for accounts if I get their orders."

Mahomet Must Go to the Mountain.

"You don't know that, Charley," said Hartman, Junior. "You haven't tried. Can't you telephone some of them—or write letters about our goods—or send circulars—or advertise—or do something else to make them think of Hartman Brothers in connection with their purchases?"

"I wanted to increase my advertising, and you know it," said Martin, "but both you and Senior complained of the cost, and I had to cut it down to a little insignificant notice twice a week."

"I know, I know," said Hartman, "and I am not sure that anything could be done by newspaper advertising. You can't show up much of your line at a time in that way—just a holler for Hartman Brothers and a mention of one or two specialties. Booklet? What kind? On belting? That's only one line, Charley, and not your most profitable one, either. Make it cover factory supplies in general, then? Sort of a catalogue, eh? Oh, I know you have told me often enough that we haven't a catalogue to give customers, but I didn't think it essential. Besides, you haven't got a man capable of getting it out. Who wrote that Building Supplies advertisement for you for last Sunday's *Globe*? Sam Masters, eh? Do you think he could prepare such a catalogue as you would want? Matters are pretty quiet in his line just now, and if he could do the work there would be no increased expense for salaries."

"I'll tell you what," said Junior finally, as he rose to go. "Think things over and make up your mind as to what you want, and submit something definite to me. It might not be a bad idea to talk the matter over with Sam and see if he can give you the book you want."

An Invitation Given—

Five minutes later I was sitting in the same chair beside Mr. Martin's desk and he was eagerly relating to me the talk he had had with Hartman Junior. He said that he wanted to strike quickly, while Junior was in a pliant mood; that he was certain that a catalogue for popular circulation would be a trade winner, and that he had confidence in my ability to get it out.

"Come down here and work for me for a while, Sam," said he. "There will never be anything for you in Sporting Goods as we handle them, and I am sure you can be worth more to the house here than where you are. Let the Cutlery man absorb your line, as he is trying to do."

And Accepted.

I told him truthfully that I should be glad to work for him if it could be arranged to the satisfaction of all. While we were talking Hartman, Junior, appeared, and laid upon Mr. Martin's desk the Blue Book of a famous New York jeweler, which I had taken from the catalogue file and laid upon his desk early in the morning.

"This looks good to me," said he. "Was something of this kind what you wanted, Charley?"

Mr. Martin examined it. The possibilities of a list of factory supplies similarly arranged were thoroughly canvassed, and when Hartman, Junior, turned away it was decided that I should at once begin the preparation of a catalogue to resemble in general style and arrangement the Blue Book mentioned, but to list fully and briefly the Hartman Brothers' line. Mr. Martin did the most of the talking. I ventured to make an occasional suggestion, and Hartman, Junior, assented to the most of what was said.

And so it was arranged that I should go into the city store to help Mr. Martin by compiling a catalogue, and it was at Mr. Martin's urgent request that the work was undertaken.

(To be continued.)

The Cambria Chain Company.

THE CAMBRIA CHAIN COMPANY has recently been organized at Johnstown, Pa., and has leased a new and modern building, 50 x 160 ft., at Woodvale, which will admirably suit its purposes, and which is now being equipped with furnaces, die hammers, forges, blowers, drop forging machines, &c., all of which will be electrically operated, for the manufacture of all kinds of Hand and Machine Made Chain, Drop Forgings, &c. The business will be in charge of competent men who have had considerable practical experience, and it is expected the new plant will be ready for operation in the latter part of October.

J. B. HOWAT, who has been vice-president and general manager of the Dillon-Griswold Company, Sterling, Ill., has resigned to become the head of the Sharon Hardware Mfg. Company, Sharon, Pa., which has lately been organized and is at present erecting a large building for the manufacture of Hardware specialties.

Central Electric Company's Catalogue.

THE CENTRAL ELECTRIC COMPANY, Chicago, Ill., has issued a general catalogue, No. 26, referring to an exhaustive line of electrical and allied supplies. In compiling the catalogue, the company states that it has endeavored to include all material and appliances that are necessary or useful in the construction and operation of electrical illustrations and apparatus of every character. As far as possible, full and accurate descriptions are given of all goods. The work is a large one, containing over 1000 pages, is substantially bound, and conveniently arranged and indexed. It should prove a valuable and useful addition to the trade library of merchants who stock these lines or handle them even in a casual way.

Saw Display Case.

E. C. ATKINS & CO., Indianapolis, Ind., have just put out a new display case for Hand Saws. It is designed to set upon the floor or counter, as preferred, and is described as a handsome and convenient fixture which will not only attract favorable attention to the line, but will also permit a salesman to locate and reach any Saw without effort. The case is 25 in. square and 39 in. high, having four glass sides, two of which are fitted with hinges. The case revolves on a circular base,

E. C. Atkins & Co.'s Saw Display Case.

and there are a series of slots on two sides into which the stock of Saws is to be placed. Each side has room for 18 Saws, which with the eight display Saws accommodated in pairs on each of the four sides, gives a total capacity of 44 Saws. The case is furnished in solid oak, finished as desired, in golden antique, Flemish, weathered or Mission. It is distributed on terms which may be learned on application to the company.

Calf Weaning Muzzle.

The Cooley Mfg. Company, 103-105 South Canal street, Chicago, Ill., is putting on the market a device for weaning calves and colts, and for use on cows and horses. It is made of steel wire dipped in hot tin, after being formed, to prevent rust, and is firmly constructed. The Muzzle permits the animal to eat grass, hay or grain on the ground and drink water or milk in the ordinary way without undue interference, while at the same time effectually preventing sucking. The weaner is held over the animal's nose by a halter, which is fastened back of the ears. About an inch of play is left between the nose and the bottom of the weaner, so that in eating the nose will pass through the back opening on the grass, but when the head is raised to suck the weaner automatically drops back over the nose. The device is also recommended as a muzzle for horses when plowing tall corn and for stock turned into ripe corn fields where there is grazing grass. They can eat the grass without hindrance, but the muzzle drops over their nose when they raise their heads to the standing ears. The weaners are made in three sizes.

Ball Pein Hammers for Automobile Kit.

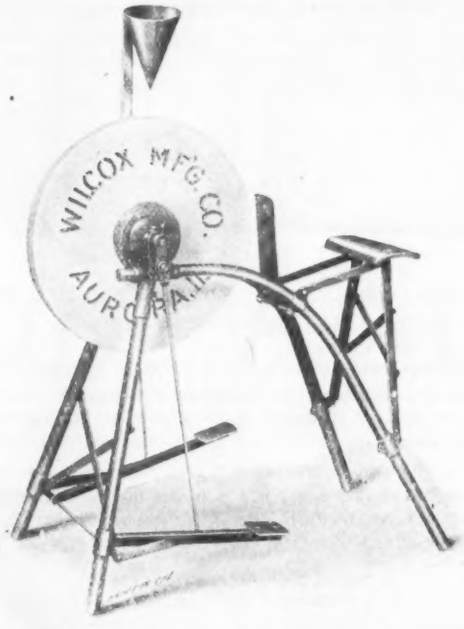
The David Maydole Hammer Company, Norwich, N. Y., represented by Willis Simpson, 155 Chambers street, New York, has supplemented its extensive and well known line by the addition of a line of ball pein hammers, designed especially for an automobile kit. The three sizes range from 7 to 13 ounces, with an intermediate weight of 10 ounces. The handles, of second growth hickory, are of proper length for such use, regularly 9½, 10¼ and 11¼ in., or they may be obtained in shorter lengths. The hammer proper is forged from crucible cast steel, carefully hardened and tempered by hand. It is oil finished and has polished face and pein.

Iron Block Plane.

The Central Hardware Company, Philadelphia, Pa., C. E. Peabody & Co., 155 Chambers street, New York, sales agents, has just put on the market a new tool in the way of an iron block plane, with tempered steel plane iron. The plane has a frame or body 5½ in. long, and an actual cutting width of 1 5-16 in. A feature to which attention is called is the low price at which the tool is offered.

The Wilcox-King Tubular Steel Grind Stone No. 025.

A new design in a tubular steel grindstone frame distinguished as No. 025 Wilcox-King, is being marketed by the Wilcox Mfg. Company, Aurora, Ill. While combining a proper degree of rigidity, this construction, it is claimed, admits of enough flexibility to enable the frame to adjust itself to uneven floors or surfaces. It is entirely self-contained, the back legs carrying a steel supported operator's seat, while bi peddle power is supplied by the attachment of a peddle to each of the front legs.

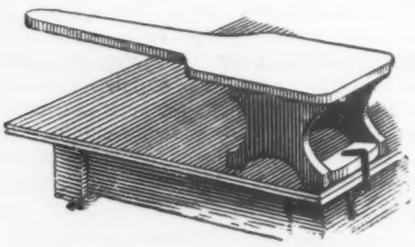


The Wilcox-King Tubular Steel Grindstone No. 025.

The bearings on which the stone is mounted are adjustable and may be moved forward or backward on the frame as may suit the convenience of the operator. The crank is supplied with ball bearings as are also the journal bearings. The seat is adjustable vertically to the extent of from 4 to 5 in. For shipment the grinder is crated complete with the face of the stone protected.

The Gem City Laundry Board.

The accompanying illustration represents a new style of laundry board made by the J. W. Quilling Mfg. Company, Quincy, Ill. The base of the board is 9 in. wide by 12 in. long and tapers from the shoulder to a width of 3½ in. at the small end. The board is 2 ft. 6 in. long over all and is made of pine or poplar lumber 1 in. thick. It is mounted on bench legs which stand 6 in. high and



The Gem City Laundry Board.

have a width of 7 in. A cross piece fastened between the rear feet serves as a clamp bar by which the board is firmly clamped to the table, as shown in the illustration. The top of the ironing board is covered with a sheet of No. 10 asbestos board to protect the wood from heat and warping. The asbestos should be covered with cotton sheeting tacked to the edge of the board. The shape of the board is designed to meet the requirements of convenience and satisfactory work in ironing shirt waists, sleeves, yokes, collars, cuffs and other garments, which are not easily handled on an ordinary board.

Hibbard, Spencer, Bartlett & Co.'s Phantom Beveled Axe.

As an addition to their line of bronzed and polished axes under "Our Very Best" brand, a new Phantom

Hibbard, Spencer, Bartlett & Co.'s Method of Packing Phantom Beveled Axes.

bevel axe is being distributed by Hibbard, Spencer, Bartlett & Co., Chicago. It is claimed for these axes that they not only embody all of the points of high quality in the regular "O. V. B." axes, but the pattern, grinding and finish are improved to an extent that justifies the new axe being called an "expert chopper's axe." The axe is full polished and made with a high grade crucible laid steel bit. The phantom bevels are ground by hand instead of being drop forged, as on most hollow bevel axes. Consequently, it is explained, there are no sharp corners to the bevels to cause extra friction, and the bevels afford perfect clearance when chopping, preventing the bit from binding in the cut. The handle is securely fitted and wedged and properly hung. Special attention is called to the packing of these axes, which is illustrated herewith, each axe being individually neatly labeled, wrapped in paper and packed in a separate pasteboard carton, with the weight stamped on each. These cartons are packed 12 assorted weights in a case. It is pointed out that this method of packing permits the axes to be attractively displayed on the merchant's shelf, and the weight desired readily selected from the assortment; also, that each axe is kept in the best of condition until it reaches the customer's hands. These axes, in common with other brands sold by the house, are sold either with or without handles, and a large range of choice is given of handles which may be used.

S. & I. Never-Break Screw Driver.

The screw driver illustrated herewith is made by the S. & I. Company, Springfield, Mass., which remarks that

Fig. 1.—S. & I. Never-Break Screw Driver.

Fig. 2.—S. & I. Screw Driver — Method of Setting Blade, Washer and Cap.

the tool is notable for durability of construction, beauty of design and excellence of finish. The blade is forged from best tool steel correctly tempered. The handle is made of hard wood and has a highly polished cocobolo finish. The metal cap and washer are made from cold rolled steel, and the ferrule is nickel plated. By the method of construction which is illustrated in Fig. 2 the blade passes through the handle and is riveted to the recessed washer. The cap, with four inverted prongs, is driven into the top of the handle, engaging with the washer, preventing the blade turning and permitting pounding the driver without injuring the handle. Sizes offered range from 2 to 12 in.

An Improved Punch Knife.

Adolph Kastor & Bros., 109 Duane street, New York, with factory at Camillus, N. Y., have patented and are putting on the market an improved punch, which they make up in combination with a pocket knife, as shown herewith. The advantage of the punch is that it has a

An Improved Punch Knife.

sharp cutting knife edge, which can be used for cutting purposes, while also providing a strong, efficient and inexpensive tool for quickly piercing and boring smooth circular holes in leather, wood or in other penetrable materials.

Emery Wheel Dresser.

The feature of particular interest in the emery wheel dresser made by Collmer Brothers, South Bend, Ind., and herewith illustrated, is the substitution of spring bushings for turned bushings, more commonly used in tools of this character. It is claimed that the spring bushings being less likely to loosen in the handle, add both to the durability and running qualities of the dresser. The

Emery Wheel Dresser.

handle, which is 12 in. in length, is a solid casting, neatly japanned, with a fluted hand grip. Cutter wheels supplied with the tool are specially tempered with a view to making them stand without breaking and at the same time to avoid a degree of softness that would cause excessive wear. The holder accommodates a set of four wheels 1⅛ in. in diameter, having a combined grinding face of ½ in. The tools are packed separately in an attractively labeled pasteboard box, with an extra set of cutters for each handle.

The Bascom Adjustable Tap Wrench.

The A. J. Smart Mfg. Company, Greenfield, Mass., has put on the market the Bascom adjustable tap wrench in six sizes, from 7 to 34 in. in length, accommodating hand taps from ¼ in. and smaller to 1½ in., as shown in the accompanying illustration. The wrench has gunlock (mottled) finish, while the handles are made from best

The Bascom Adjustable Tap Wrench.

steel tubing, knurled the required length to prevent slipping in greasy hands. The jaws are made of best tool steel, carefully hardened and tempered, and, it is stated, should last indefinitely with proper care. The nut is so arranged that it can be easily turned to afford a good grip.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.
Linseed, State and Western, raw	.41 @43
City, Raw	.43 @44
Boiled, 1¢ ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.70 @..
Lard, Prime, Winter	.75 @78
Extra No. 1	.51 @52
No. 1	.49 @50
Cotton-seed, Crude, f.o.b. mill	.30 @31
Summer Yellow, prime	.40 @40½
Summer, White	.43 @44
Yellow Winter	.45 @47
Tallow, Acidless	.60 @61
Menhaden, Brown, Strained	.35 @36
Northern Crude	.24 @..
Southern	.24 @..
Light Strained	.35 @36
Bleached Winter	.37 @39
Ex. Bleached Winter	.39 @41

	℔ lb
Cocoanut, Ceylon	6¾@ 6⅞
Cochin	7¼@ 7½
Cod, Domestic, Prime	.38 @40
Newfoundland	.40 @42
Red, Elaine	.40 @41
Saponified	5⅞@ 6⅛
Olive, Yellow	$0.95@$1.00
Neatsfoot, Prime	.55 @58
Palm, Lagos	6¼@ 6⅜

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	.13½@14
Summer	.12½@13
Cylinder, light, filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	.14½@15
903 sp. gravity	.13½@14
863 sp. gravity	.11 @11½
Red	.13¼@14

Miscellaneous—

Barytes,	
White, Foreign	℔ ton $18.50@20.50
Amer., floated	℔ ton 17.00@18.00
Off color	℔ ton 12.50@15.00
Chalk, in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00

	℔ gal.
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb 42@52
Gilders	℔ 100 lb .55@ .60
Ex. Gilders	℔ 100 lb .60@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.80
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls	.38½@39
In machine bbls	.39 @39½

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	℔ lb
Bleached, Commercial	.23 @24
Bone Dry	.28 @29
Button	.30 @40
Diamond I	.. @37
Fine, Orange	.34 @35
A. C. Garnet	.27 @28
G. A. L	.20 @21
Kala Button	.18 @19
D. C	.. @38
Octagon B	.35 @36
T. N	.25 @26
V. S. O	.. @37

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red Lead &c.—

	℔ lb
Lead, English white, in Oil	.10⅛@10⅝
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	.. 7
Dry and in Oil, 25 and 50 lb kegs	.. 7¼
Dry and in Oil, 12½ lb kegs	.. 7½
In Oil, 25 lb tin pails	.. 7½
In Oil, 12½ lb tin pails	.. 8
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	.. 9
Red Lead and Litharge:	
In 100 lb kegs	.. 7
In 25 and 50 lb kegs	.. 7¼
In 12½ lb kegs	.. 7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American, Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	.5½@ 5⅝
Red Seal (French process)	.6⅝@ 7
Green Seal	.7¼@ 7½
German Red Seal (French process)	.6⅝@ 7
Green Seal	.7¼@ 7⅝
White Seal	.7⅝@ 8¼
French, Red Seal	.8⅜@ 8⅞
Green Seal	.10⅜@10⅝

Dry Colors—

	℔ lb
Black, Carbon	.6½@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.31 @33
Blue, Prussian	.29 @31
Blue, Ultramarine	.3½@15
Brown, Spanish	.½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Ocher, American	℔ ton $8.50@16.00
American Golden	.2½@ 3¼
French	.1¾@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.12½@13
German	.12 @13
American	.9 @10
Red, Indian, English	.4½@ 6
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1¼@ 2
American Burnt and Pow'd	.1½@ 2
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .90@ 1.00
English	℔ 100 lb .80@ 1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, T'key, Bnt, & Pow.	.2¾@ 3
Turkey, Raw and Powdered	.2¾@ 3
Burnt, American	.1½@ 2
Raw, American	.1½@ 2
Yellow, Chrome, Pure	.13¾@15
Vermilion, American Lead	.7 @23
Quicksilver, bulk	.65 @..
Quicksilver, bags	.. @66
English, Imported	.65 @70
Chinese	.$0.90@1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

ISSUED EVERY THURSDAY MORNING.

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TWO DOLLAR EDITION, $2.00 a year; DOLLAR EDITION, $1.00 a year, to the United States, Mexico, Hawaii Cuba, Philippine Islands. OTHER COUNTRIES: Weekly Edition $7.50; Semi-monthly Edition, $4.00; Monthly Edition, $2.50.

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New York (Main Office)	14-16 Park Place,	DAVID WILLIAMS CO., Pub.
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Pittsburgh,	Park Building, 357 Fifth Avenue,	ROBERT A. WALKER, Manager.
Chicago,	Fisher Building, Dearborn and Van Buren Streets.	A. A. AINSWORTH, Manager.
Cincinnati,	Pickering Building, Fifth and Main Streets,	HENRY SMITH, Manager.
Boston,	Compton Building, 161 Devonshire Street,	WALTER C. ENGLISH, Manager.
Cleveland,	The Cuyahoga, 311 Superior Street,	EZRA S. ADAMS, Manager.

Remittances should be made by Draft, payable to the order of DAVID WILLIAMS COMPANY on any banking house in the United States or Europe, or by Post Office, Bank or Express Money Order on New York. When those cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A. The International News Company, New York, U. S. A., and London England; or the San Francisco News Company, San Francisco, Cal. U. S. A.

ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND CLASS MATTER

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic....33⅓%
North's....10%
Upson's Patent, ₱ gro., $29.90....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent....35%
Ives' Stop Bead Screws and Washers....10%
Taplin's Perfection....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs....$2.00@$3.00

Anvils—American—

Eagle Anvils....₱ lb @8 ¢
Hay-Budden, Wrought....9½@9¾¢
Trenton....₱ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb....10@10½¢
Peter Wright & Sons, ₱ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co....10%

Augers and Bits—

Com. Double Spur....75&10@80%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's....35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Swan's....65&10@70%
Swan's, Jennings' Pattern....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18....60&10%
Ford's, Clark's Pattern...60&5@60&10%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's....60%

Gimlet Bits—

Per gro.
Common Dbl. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames....20&10%
Universal....20%

Ship Augers and Bits—

Ship Augers....40&10@—%
Ford's....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's....6%
Watrous'....33⅓&7½%
Snell's....48%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—Iron or Steel.

Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar....4½@5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style..4¼@4¾¢
No. 2 Solid Collar....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12....70%
Nos. 13 to 14....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—

Common and Concord, not turned....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—

Caldwell new list....50&10%
Pullman....50&10%

Spring—

Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beam, Scale—

Scale Beams....40%
Chattillon's No. 1....30%
Chatillon's No. 2....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned....$0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned....$1.20
No. 10 Wire Tinned....₱ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3 Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Split Leather....60&10@65%
Grain Leather....50@50&10%

Hand—

	6	7	8	9	10
Inch..					
Doz..	$5.00	5.50	6.00	6.50	7.50

Molders—

	10	12	14	16
Inch..				
Doz..	$7.50	9.00	12.00	15.00

Net Prices.

Bells—Cow—

Wrought Cow Bells....75%
Jersey....75&10%
Texas Star....50%

Door—

Home, R. & E. Mfg. Co.'s....55&10%

Hand—

Polished, Brass....60@60&10%
White Metal....60@60&10%
Nickel Plated....50&10%
Swiss....50&10%
Cone's Globe Hand Bells....33⅓@33⅓%

Miscellaneous—

Farm Bells....lb., 2¼@2½¢
Church and School....60@60&10%

Belting—Leather—

First Quality, Ex. Hy., Strictly Short Lap....60&10%
Standard....70&10@70&10&5%
Light Double....75&10%
Cut Leather Lacing....50%
Leather Lacing Sides, per sq. ft. 23@24¢

Rubber—

Competition (Low Grade), 70&10@75%
Standard....60&10@70%
Best Grades....40@50%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters....20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1908 list: Chain, Parts, Spokes....50%
Tubes....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior....30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined....55%
Embossed....55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co....33⅓&10%

Bolts Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ x 6 and smaller..75&5@—%
Larger and longer....70&5@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends....70&10@—%
Machine (Cut Thread):
⅜ x 4 and smaller..75&10@—%
Larger and longer...70&10@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

	3	4	5	6	8
Inch ...					
Per doz..	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

	6	8	10
Inch ...			
Per doz..	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

	6	8	10
Inch ...			
Per doz..	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

	6	8	10
Inch ...			
Per doz..	$0.75	.95	1.25

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed....60&10%
Spring....70&10@70&10&10%
Shutter....50&5@50&10&5%
Square Neck....75@75&10%
Square....70&10&10@80%
Ives' Mortise....10%
Ives' Wrought Metal....10%

Expansion—

F. H. Evans' Crescent....40@60%
Richards Mfg. Co....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type..60&10&5&2½%
Star, Wood Screw Type....40%
Star, Machine, Single Wedge....60%
Star, Machine, Double Wedge....60%
Steward & Romain Mfg. Co.:
Style No. 13, Double....60%
Style No. 1, Single....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw....66⅔%

Plow and Stove—

Plow....65&5@70%
Stove....85@85&5%

Tire—

Common Iron....80%
Norway Iron....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99....80%
Norway Phila., list Oct. '84....80%
Eagle....82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

	1¼	1½	1¾	2
Inch.....				
Per doz...	$4.80	5.60	6.40	8.00
Inch.....			2¼	2½
Per doz.....			$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—

C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme....15&10%
Perfection....40%
Seavey....45%

Braces—

Common Ball, American....$1.50
Barber's....50&10%10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 61, 166, 206, 614....50%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat..50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—

Wrought Steel.....75&10&5@80%
Bradley Metal Clasp...80&10@80&10&5
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Taplin Victor Handy Egg Beater Bracket....₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—

M'fr's list, price per gross.

	Quart..	10	12	14	
Water, Reg...		26.85	29.50	33.50	10&7½&5&5%
Water, Hvy...		45.35	48.00	52.00	
Fire, Rd. Btm.		32.00	34.65	38.65	
Well....		37.35	41.35	45.35	

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct.'06,'06.65%
Cast Brass, Tiebout's....40&10%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5
Parliament Butts....70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c....70%
Back Flaps, Table Chest..65%

Japanned.
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad....40&5%
Steeple Tipped....70%
Ball Tipped....70%

Extra, 10—

Cages, Bird—
Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel..... 4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Caps, Percussion—
Eley's E. B..... .52@55¢
G. D..... per M 34@35¢
F. L..... per M 40@42¢
G. E..... per M 48@50¢
Musket ..... per M 62@63¢

Primers—
Berdan Primers, $2 per M.. 20¢
Primer Shells and Bullets.. 15&10%
All other primers per M. $1.52@1.60

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball.... $1.40
Central Fire..... 25%
Target and Sporting Rifle. 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—
Bed ..... 65&10@70%
Plate ..... 60@60&5%
Philadelphia ..... 70&10@75%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem (Roller Bearing)..... 70%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list...40&10%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Proof Coil—
American Coil, Straight Link:
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝
$8.15 5.35 4.60 3.95 3.75 3.65 3.55
¾-⅞-1 1⅛ to 1¼ inch.
$3.45 3.55
In cask lots, deduct 25¢.
German Coil..... 70%
German Pattern Coil:
6-0 to 1..... 70&10&5%
2 and 3..... 60&10&10@70%
4, 5 and 6..... 50&10@50&10&5%

Halter—
Halter Chains..... 60&5@60&10%
German Pattern Halter Chains, list July 24, '97.... 60&10&5@70%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring. $28.00
6½—6-2, Straight, with ring. $29.00
6½—8-2, Straight, with ring. $32.00
6½—10-2, Str'ght, with ring. $37.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c... 60&10@60&10&5%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron ..... 60&10&7½%
Brass 65%
Safety and Plumbers' Chain. 75%
Gal. Pump Chain.... lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil.35&2½@40%
Triumph Dog..... 50&10@60%
Brown Halter and Coil....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@10%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain....70%

Chain and Ribbon, Sash—
Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk—
Carpenters' Blue..... gro., 50¢
Carpenters' Red..... gro., 50¢
Carpenters' White..... gro., 40¢

Checks, Door—
Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools..... 55%
Youths' Chests, with Tools..... 40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—
Socket Framing and Firmer
Standard List..... 80&10@—%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10..... 25&7½%
Socket Framing No. 15..... 25&7½%
Swan's ..... 66⅔&70%
L. & I. J. White & Co..... 30@30&5%

Tanged—
Tanged Firmers..... 30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co..... 25&5%

Cold—
lb.
Cold Chisels, good quality. 13@15¢
Cold Chisels, fair quality. 11@12¢
Cold Chisels, ordinary.... 9@10¢

Chucks—
Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck..... 40
Beach Pat, each $8.00..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws..... 35%
Universal, Com. Style Jaws..... 40%
Combination, Reversible Jaws....35%
Combination, Com. Style Jaws...40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks..... 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ...25%
Positive Drive..... 40%
Planer Chucks..... 20%
Standard 45%
Drill Press Vises..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—
Adjustable Hammers..... 20&5%
Carriage Makers', Star, P., S. & W. Co. 50%
Besly, Parallel..... 33⅓&10%
Myers' Hay Rack..... 50%
Lineman's Swedish Neverturn..... 65%
Wood Workers' Hammers..... 40&5%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,
Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—
Star Socket, All Steel..℔ doz. $1.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—
Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Roll Bearing Horse, each.....$6.75
Stewart's New Model Sheep Shearing Machine, each.$12.75
Stewart Enclosed Gear Shearing Machine, No. 5, each..$9.75
} 20%

Clips, Axle—
Regular Styles, list July 1, '05. 80&80&10%

Cloth and Netting, wire
—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 70%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.
Ordinary Goods..... 70&10@75%

Conductor Pipe,—
L. C. L. to Dealers:

	Gal. Steel.	Charcoal.	Copper.
Northeastern:			
	70&10%	50&10&7½%	50&10%
Eastern:			
	70&10&5%	50&10&7½%	50&10%
Central:			
	75&5%	60%	50&10%
Northwestern:			
	75&2½%	60%	50&10%
Western:			
	70&7½%	50&12½%	50&5%
Tennessee:			
	70&10%	50&12½%	50&10%
Southern:			
	70%	50&12½%	50&5%
Southwestern:			
	70%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—
L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized,ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—
See *Tools, Coopers'.*

Coppers, Soldering—
Soldering Coppers, 3 lb. to pair and heavier, 20¢; lighter than 3 lb. to pair..... 22¢

Cord— Sash—
Braided, Drab..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 20¢; No. 7, 20½¢; No. 6, 21½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India..... lb., 11@11½¢
Cotton Sash Cord, Tw'ted. 18@20¢
Patent Russia..... lb.... 20¢
Cable Laid Russia..... lb... 21¢
India Hemp, Br'd'd..... lb... 21¢
India Hemp, Twisted... lb. 13@14¢
Patent India, Twisted.. lb... 17¢
Pearl Braided, cotton, No. 6, ℔ lb, 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10..... ℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢
Massachusetts, White...℔ lb 40¢
Massachusetts, Drab...℔ lb 45¢
Phoenix, White, Nos 8 to 12.... 27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—
Full Length..... 90@—%
Short Length..... 90&20@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—
Grain 50%

Crayons—
White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00
Suremark, Black, $2.25; Blue, Red and Yellow.....$2.50

Crooks, Shepperds'—
Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden..... 50%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847.℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—
American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%

No. 202, $1.50..... 10&7½%
P. S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz. $24.00. 40%
Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $12.00..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Siaw and Kraut—
Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater .....℔ doz. $4.00

Tobacco—
All Iron, Cheap...doz, $4.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—
Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.50
Split Handle Post Hole Diggers, ℔ doz., $7.50
Hercules Pattern, ℔ doz..... $9.50
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—
See *Knives, Drawing.*

Dressers Emery Wheel—
Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—
Blacksmith's Common Drilling Machines ..... $1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
C. & C. Ratchet..... 25%
Reversible Ratchet Die Stocks....25%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $1.86; 2, $8.16.
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved ..... 40@40&5%
Ratchet, No. 012..... 40@40&5%
Ratchet, Celebrated..... 40@40&5%
Ratchet, Whitney's, P., S. & W.. 40&10@50%
Whitney's Adjustable, No. 10, $12.00. 33⅓%

Twist Drills—
Bit Stock..... 70@70&5%
Taper and Straight Shank. 60&10@70%

Drivers, Screw—
Screw D'vcr Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 60%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern	*75&10&5%*	*50&10%*
Eastern	*80%*	*50&10%*
Central	*80&10&5%*	*50&10%*
Northwestern	*80&10&5%*	*50&10%*
Western	*80&5%*	*50&5%*
Tennessee	*80&5%*	*50&10%*
Southern	*75&10%*	*50&5%*
Southwestern	*75&10&2½%*	*50&5%*

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories:

	Galv. Steel.	*Galv. C. I. and Copper.*
Sizes 2, 3, 4		*80%*
Sizes 1½, 2½, 3½, 5, 6		*60&10%*
No. 26		*50%*
No. 24		*25%*
Copper Elbows		*50%*

Elbows, Stove Pipe—
Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, Flat Crimp..40&10&5%

Emery, Turkish—

	¼ to ⅝:	*5/4 to 2/0:*	*Flour.*
Kegs ..... *lb.*	5 ¢	5½¢	3½¢
½ Kegs ..... *lb.*	5½¢	5¾¢	3¾¢
¼ Kegs ..... *lb.*	5½¢	6 ¢	4 ¢

10-lb. cans, 10 in case....6½¢ 7¢ 6¢
10-lb. cans, less than 10.....10¢ 10¢ 8¢
Less quantity..10¢ 10¢ 8¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, Lemon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₱ gro., $1.08.....10%
Titan, ₱ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, .. 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined....50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ₱ doz., $36.00.....40&10%
Lane's, ₱ doz., $36.00.....40&10%
National Measuring, ₱ doz, $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	15	17	19	21
Per doz	$3.60	3.85	4.15	4.65

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	....30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1905, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.60

Freezers, Ice Cream—

Qt.....	1	2	3	4	6
Each....	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P. S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $3.00; 2, $3.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade...*gro.$6.00@$6.50*
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....65@65&10%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...15@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@75%
Blacksmiths' 50%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₱ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...*80&10%*
3 to 5 lb., per lb., 40¢...*80&10&10%*
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢..*80&10&10%*

Handles—
Agricultural Tool Handles
Axe, Pick, &c....*60&10@60&10&5%*
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...*gro.$3.00@$3.50*
Brad Awl.....*gro.$1.65@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....*$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory.....*1.60@1.75*
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....*gro.$1.30@$1.40*
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....*65@75¢*
Plane Handles:
Jack, doz., 30¢; Fore, doz...*45¢*
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz, R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
Extra 5@10% often given.

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00: Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.98
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track ..50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₱ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41, 2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₱ doz., 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%

Hangers— Garment—
Pullman Trouser, ₱ gro. No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—
Regular list, first qual.40&12½@—
Second quality.....*50&10&5@—*

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: Doz. Sets with Fastenings, Net, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70&75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Acting.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....65&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only.....	1.25	1.90	3.50
Latches only.....	.70	.75	.85

New England:
With Latch.....*doz..@$2.00*
Without Latch.....*doz..@$1.60*
Reversible Self-Closing:
With Latch.....*doz..@$1.75*
Without Latch...*doz.*....*@$1.35*
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz..$1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₱ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co. Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...*$6.75@$7.00*
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....₱ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 11, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₱ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro, ...$12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
Spring Hinges.....33⅓%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges..*50&10%*
Heavy Strap Hinges..*60&5%*
Light T Hinges.....*50%*
Heavy T Hinges.....*40%*
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....*33⅓%*
Cor. Heavy Strap....*60&5%*
Cor. Ex. Heavy T...*50&10%*
Extra 10&7½%.

Screw Hook and Strap.
Screw Hook
6 to 12 in..*lb*.3½¢
1¼ to 20 in..*lb*.3¼¢
22 to 36 in..*lb*.3 ¢

Screw Hook and Eye:
to 1 inch.....*lb* 6¼¢
⅝-inch.....*lb*.7½¢
½-inch.....*lb*.8½¢
10&7½&2½%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	15	16	17	18
Galv. Open....	$35	$39	$42	$46
Jap. Open...	26	28	31	35
Galv. Funnel...	48	48	52	56
Jap. Funnel....	33	36	39	43

10&7½&2½%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye -

Scovil and Oval Pattern,
60&10@60&10&10%
Grub, list Feb. 23, 1899,
70&10@70&10&10%
I. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60%

Handled–

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.10
B. B., 6½ in.....$3.50
Acme Weeding.....₱ doz., net, $1.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit–

Angular, ₱ doz. $21.00.....45&10%

Door–

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool–

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar–

Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz.....$2.00

Trace and Rein–

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz.....$1.25

Hones—Razor–

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron–

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire–

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling..75&10@80%
Columbian Hdw. Co., Gem.....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; V Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron–

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton.....doz. $1.25@$1.50
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous –

Hooks, Bench, see Stops, Bench.
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Whiffletree.....lb. 5½@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes–
See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons— Sad–

From ¼ to 16.....lb. 2½@2¾¢
B. B. Sad Irons....lb. 3¼@3½¢
Mrs. Potts', cents per set:

	Nos.	50	55	60	65
Jap'd Caps		*86*	*93*	*96*	*93*
Tin'd Caps		*91*	*88*	*1.01*	*98*

New England Pressing..lb. 3¾@4¢

Bar and Corner–

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking–

Pinking Irons.....doz. 00@$24

Irons, Soldering
See *Coppers.*

Jacks, Wagons–

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder–

Richards Mfg. Co., Ladder Jacks..50%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn–

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing–

Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw–

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous–

Farriers' .....doz. $2.60@3.55
Wostenholm's .....₱ doz. $3.00@3.25

Knobs–

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting–

L. & G. Mfg. Co., Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....60%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular–

Regular, No. 0.....doz. $4.35@4.50
Side Lift, No. 0.....doz. $4.60@4.75
Hinge Globe, No. 0. doz. $4.60@4.75
Other Styles.....40@40&10%

Bull's Eye Police–

3-inch .....$3.75@4.00

Latches— Thumb–

Roggin's Latches, Jap'd, with Screws .....doz. 35@40¢

Door–

Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$4.50

Leaders, Cattle–

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—
See *Pumps–*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....50%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet–

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c —

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....15%

Padlocks–

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.–

Ives' Patent:
Crescent.....10%
Automatic Gravity Metal Sash, ₱ gro., $149.58.....10%
Window Ventilating.....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%
Taylor Mfg. Co., Perfect Ventilating, ₱ doz.....$0.75@$1.00

Machines—Boring–

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking–

Reisinger Invincible Hand Power....₱ doz. $48.00

Fence–

Williams' Fence Machines....each, $5.50

Hoisting–

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting–

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory .....45&5&50%
Lignumvitæ .....45&5&50%
Tinners' Hickory and Applewood .....doz. 45&5&50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Shell and Corn.....25&10%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%

$2.50	3.50	10.00	15.00.....33⅓%
No. 1.	2	3	4
Lippincott's: No.....	1	2	3	4
	$2.50	3.50	10.00	15.00..33⅓%

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@ 20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M, S, C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous .....85&5@85&10%
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	.. ₱ lb. net, 12¢
Coleman	13	12	12	11	11	net ₱ lb
New Haven..	23	21	20	19	18	.. ₱ lb. net, 12¢
Livingston	19	18	17	16	16	.....10%
Western						₱ lb 8½¢

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters–

Brass 30%
Plated .....30&10%

Nippers
See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples.....80%

Nuts— *Blank or Tapped.*

Cold Punched: Off list.
Square .....5.40@5.50¢
Hexagon .....6.00@6.10¢
Square, C., T. & R..5.80@5.90¢
Hexagon, C., T. & R. 6.60@6.70¢
Hot Pressed:
Square .....5.80¢
Hexagon .....6.30¢

Oakum—

Best .....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy .....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc .....65&10&10%
Railroad .....60&10&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70&10&10%
Railroad Oilers, &c.....60&10&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70&10&10%
Railroad Oilers, &c.....60&10&10%

Openers—Packing Box–

Herculever, ₱ doz., $24.....30%

Can Openers–

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle.....40¢
Sardine Scissors.....$1.75@3.00
Can and Bottle Openers, ₱ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty.....$3.75

Egg–

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing. Wick and Rope, any quantity.....18@20¢

Rubber–
(Fair quality goods.)

Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb, 80¢.....25%

Miscellaneous–

American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute .....lb. 4@4½¢
Russia Packing.....lb. 9@10¢

Pails, Water, Well, &c.—
See *Buckets.*

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List..70&10@70&10&5%
Edwards, Royal Blue.....75%

Fry–

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.–

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft...2½¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....3¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 56@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....$54.30
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper–

1 ply (roll 400 sq. ft.), ton. $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple–

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Hay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $30.00

Livingston Nail Co.:
Daisy ..... ₱ doz. $4.00
Little Star ..... ₱ doz. $5.00
Rocking Table ..... ₱ doz. $6.20
Reading Hardware Co.:
Advance ..... ₱ doz. $4.00
Baldwin ..... ₱ doz. $4.00
Reading 72 ..... ₱ doz. $3.25
Reading 78 ..... ₱ doz. $6.25

Orange—
Goodell Co., Success ..... each $20.00

Potato—
Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $6.00

Picks and Mattocks—
(List Jan., 1908.)
List ..... 70&10@70&10&10%
Cronk's Handled Garden Mattock, ₱ doz., $3.00 ..... 33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in ..... 70@—%
Extra Heavy, 2-6 in .. 75&10@—%
Fittings, Standard and Heavy, 80&10@80&10&10%

Pipe, Merchant—

	Consumers, Steel. Blk.	Galv.	Carloads, Iron. Blk.	Galv.
	%	%	%	%
⅛ and ¼ in..	66	50	64	..
⅜ in.....	68	54	66	52
½ in.....	70	58	68	56
¾ to 6 in....	74	64	72	62
7 to 12 in....	71	56	69	54

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$5.90	$6.90
6 in., Uniform Color	6.40	7.40
7 in., Uniform Color	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual ..... 30@30&10%
Bench, second qual ... 40@40&10%
Molding ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes -
Chaplin's Iron Planes 60%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ₱ doz. $7.50

Plates—
Felloe ..... lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot. Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1⅛-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break ..... 75&10%

Pliers and Nippers -
Button Pliers .... 75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45 $1.50.

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$2.00	*$2.25*	*$2.75*	*$3.50*

Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor.. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston's Plumbs and Levels .... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Dulex 35%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers .... lb. 9¢
½-lb. papers ..... lb. 9½¢
¼-lb. papers ..... lb. 10¢

Police Goods—
Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ₱ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ₱ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $9.00.. 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can ... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ₱ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₱ lb 8¢
Fireside ..... ₱ gr. $2.50
Gem, ₱ gr. $1.50 ..... 10%
Japanese ..... ₱ gr. $3.50
Jet Black ..... ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ₱ doz., $24.00; each, $2.50; 1 lb cans, each ..... 75¢
Glasbright Powder, bbls., ₱ lb.. 20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro.$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb ..... each 45¢
Fine Sporting, 1 lb .... each 75¢
Rifle, ½-lb ..... each 15¢
Rifle, 1 lb ..... each 25¢
In Kegs:
25½-lb. kegs $3.50
25-lb. kegs $3.50
King's Semi-Smokeless:

	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case (1 lb cans bulk)	7.25	8.75

King's Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ₱ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Miller's Falls, No. 3, ₱ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co., Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack, ₱ doz. $0.40

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.80*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	*2¼*	*2½*	
Hot House, doz	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	2
Screw, doz	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	2	*2¼*	*2½*
Side, doz	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in .... 20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle ..... 17@20¢
Top Notch, Electrically Welded, Nos. 3 and 4 ..... 19¢
Common Sense ..... ₱ doz. 20¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₱ doz. 50%
Grand Rapids All Steel Noiseless.. 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in. ..... 20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout ..... 75&5@75&10%
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) 45%
Barnes Pitcher Spout 80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ₱ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) ..... 50&5%
Flint & Walling's Fast Mail (low list) ..... 50&5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) 50
Myers' Power Pumps 50
Myers' Spray Pumps 50

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

50%

Punches—
Saddlers' or Drive, good, doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes) .... doz. $3.50
Bemis & Call Co.'s Cast St'l Drive. 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co.. 40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44 ..... 40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail ..... 2¾¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft. $3.45
O. N. T., ₱ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ₱ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Trolley, No. 301, ₱ ft. ..... 9¢
McKinney's:
Hinged Hanger Track, ₱ ft., 11¢ ..... 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn.... $3.25
Fort Madison Blue Head Lawn.... $2.75
Cronk's:
Steel Garden: Champion, ₱ doz. 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ₱ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ₱ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ₱ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Jumbo Lawn, 36-tooth.... ₱ doz. $5.00
Lawn Queen, 20-tooth.... ₱ doz. $2.85
Lawn Queen, 24-tooth.... ₱ doz. $3.00
Paragon, 20-tooth ..... ₱ doz. $2.65
Paragon, 24-tooth ..... ₱ doz. $2.75
Steel Garden, 14-tooth.... ₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
Liverlight Bros.' Gold Medal. 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
John Engstrom Swedish 65%
Sharp Shaver 60%
Fox Razors, ₱ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. } Dis. 50%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze, 1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P, 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%; 986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel.. 50&10%
Solid Brass or Bronze Metal. 40%

Revolvers—
Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber... $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in ..... per doz. $2.50@$2.75
17 in ..... per doz. $2.75@$3.00
18 in ..... per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.50@$4.50
Hill's Ringers, Gray Iron, doz., 60@75¢
Hill's Ringers, Malleable Iron, doz. 80@95¢
Blair's Rings..per gro. $5.00@$5.50
Blair's Ringers...per doz. 75@90¢

Rivets and Burrs—
Copper ..... 50@50&10%
Carriage, Coopers', Tinners', &c.:
Black ..... 70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25c; Tin boxes, 100 count, 29@32c.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... lb. 9¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb. 7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure ..... lb. 7½@7¾¢
Sisal, Tarred, Medium Lath Yarn: Pure ..... lb. 6½@6¾¢
Cotton Rope:
Best, ¼-in. and larger... 18@20¢
Medium, ¼-in. and larger. 16@17¢
Common, ¼-in. and larger.. 10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. and up, lb. ..... 5½¢
Thread, No. 2, ¼-in. and up, lb. ..... 5¢

Wire Rope—
Galvanized ..... 37½&2½%
Plain ..... 45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete ..... 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—
Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—
Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—
Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@ 2.75; 1¼ ... $3.00@3.25; 1¼ ... $3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—
Lag, Cone Point ..... 80&10@80&10&5%
Coach, Gimlet Point ..... 80@80&10%
Hand Rail ..... 70&10@75%

Jack Screws—
Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—
Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, ... 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—
Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—
List July 23, 1903.
Flat Head, Iron ..... 87½&5@ ..%
Round Head, Iron ..... 85&5@ ..%
Flat Head, Brass ..... 80&5@ ..%
Round Head, Brass ..... 77½&5@ ..%
Flat Head, Bronze ..... 75&5@ ..%
Round Head, Bronze ..... 72½&5@ ..%
Drive Screws ..... 87½&5@ ..%

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Grass, No. 1, Plain $7.00
Clipper, Bronzed Webb $7.25
No. 3 Clipper, Pol'd Webb $7.50
No. 6 Clipper and Solid Steel $7.75
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ... $9.25@9.75
Nos. 3 and 4 Clipper, Grain, $9.50@10.00
Solid Steel, No. 6 .... $10.00@10.50

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz. sets $9.00

Sets, Nail—
Octagon ..... gro. $3.50@3.75
Buck Bros. 37½%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ℔ gro. $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ℔ doz. $7.50
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz $1.50
Mounted Kitchen Sand Stone, ℔ doz $1.50
Natural Grit Carving Knife Hones, ℔ doz $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz $1.50
Quick Edge Pocket Knife Hones, ℔ doz $2.50

Skate—
Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—
Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz, $9.00 ..... 15&10%

Shears—
Cast Iron ..	7	8	9 in.	
Best ...	*$16.00*	*18.00*	*20.00*	*gro.*
Good ...	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap ..	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel ... 60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—
Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%

Acme Cast Snips ..... 40@45&5%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 10%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel 50%
Niagara Snips 40%
P., S. & W. Forged Handles, 25%; W. R. W. 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz, $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P., S. & W. Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves—Sliding Door—
Reading 40%
R. & E. list 15%

Sliding Shutter—
Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—
Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.
Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:
Dixie, 14 x 20 in.... $4.05 $5.05
Dixie, 10 x 14 in.... 4.25 5.45
Dixie, 7 x 10 in.... 5.25 6.70

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—
25-lb. bag.
Drop, up to B $1.80
Drop, B and larger 2.05
Buck 2.05
Chilled 2.05
Dust 2.30

Shovels and Spades—
Association List, Nov. 15, 1902 ..... 40%
Avery Stamping Co. 40%

Snow Shovels—
Long Handle ..... $3.25@$3.50
Wood and Mall, D Handle, $3.75@$4.00

Sieves and Sifters—
Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro .. $12.00

Sifters, Ash—
Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz $39.00

Sieves, Seamless Metallic
	—Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire ... $1.05	*1.05*	*1.10*	*1.20*	
Tinned Wire .. $1.15	*1.15*	*1.20*	*1.30*	

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... doz. $0.90@0.95
Mesh 20, Nested .... doz. $1.00@1.05
Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 24 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list 60%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%

Eureka, Unexcelled Noiseless .. 60&7 tens.
Victor A, Noiseless .. 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—
Scythe ..... 50&10@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous
German Silver ..... 60@60&5%

Tinned Iron—
Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ℔ gro. ..... 50¢@55¢
Table Spoons, ℔ gro. ..... $0.90@$1.00

Springs— Door—
Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ℔ doz. $1.00

Carriage, Wagon, &c.—
1¼ in. and Wider: . Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45@47¢
1½ x 3 x 28 .... per pair. 68@71¢

Sprinklers, Lawn—
American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz, $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—
Nickel plated .. } List Jan. 5, 1900.
Steel and Iron . } 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10%; Iron Stock and Bevel 15%

Squeezers, Lemon
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ℔ gro. $9.00

Staples—
Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—
Enterprise ..... 25@36%

Stones, Axe—
Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—
Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—
Pike Mfg. Co., 1907 list: ℔ lb
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. ..... 60¢
Rosy Red Washita, 4 to 8 in. ..... 60¢
Washita St., Extra, 4 to 8 in. ..... 50¢
Washita St., No. 1, 4 to 8 in. ..... 40¢
Washita St., No. 2, 4 to 8 in. ..... 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) .. 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks .. 40%
Hindostan No. 1, R'g'lar ..... ℔ 8¢
Hindostan No. 1, Small ..... ℔ 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ℔ 80¢
Queer Creek Stones, 4 to 8 in. ..... 20¢
Queer Creek Slips ..... 10¢
Sand Stone ..... 6¢

33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. ℔ gro. $12.00
Lamqille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.50
Green Mountain S. S. ℔ gro. $7.00
Extra Indian Pond S. S. ℔ gro. $8.00
No. 1 Indian Pond S. S. ℔ gro. $7.50
No. 2 Indian Pond S. S. ℔ gro. $5.00
Leader Red End S. S. ℔ gro. $5.00
Quick Cut Emery ℔ gro. $10.00
Pure Corundum ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ℔ gro., $12.00 $12.00 33⅓%
Lightning (Artificial), ℔ gro., $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stevens Co. 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points . . doz. 55¢
All Steel Socket . . . doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ℔ doz., $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet— Per doz.—

Bissell Carpet Sweeper Co.:
Cyco Bearing Superba, $36.00; Triumph, $33.00; Parlor Queen, $30.00; Elite, $29.00; Boudoir, $27.00; American Queen, $27.00; Ideal, $25.00; Gold Medal, $24.00; Primier, $24.00; Prize, $24.00; Welcome, $24.00; Grand Rapids, Nickel, $24.00; Japan, $22.00; Crystal, $36.00; Grand, $36.00; Parlor Grand, $48.00; Club, $54.00; Hall, $60.00; Standard Nickel, $22.00; Standard Japan, $20.00; Crown Jewel, Nickel, $21.00; Crown Jewel, Japan, $19.00; Junior, Nickel, $22.00; Junior, Japan, $20.00.

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks . . . 90&40%
American Cut Tacks . . . . . 90&40%
Swedes' Cut Tacks . . . . . 90&40%
Swedes' Upholsterers' . . . . 90&50%
Gimp Tacks . . . . . 90&50%
Lace Tacks . . . . . 90&50%
Trimmers' Tacks . . . . . 90&40%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks . . . . . 90&50&10%
Hungarian Nails . . . . . 80&20%
Finishing Nails 70%
Trunk and Clout Nails . . . 80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&6 tens@—%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin . . . . 50@—%
Patent Leather . . . . . 25@30&5%
Steel . . . . . 33⅓&5%
Chesterman's . . . . . 25@35&5%
Keuffel & Esser Co.:
Favorite, Ass Skin . . . . . 40&10@50%
Favorite, Duck and Leather . . . . . 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin . . . . . 40&10@50%
Metallic . . . . . 30@30&5%
Patent Bend, Leather . . . 25&5@25&10%
Pocket . . . . . 40@40&5%
Steel . . . . . 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lb . . . . . $2.85@3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. . . . . 30@35%

Ties, Bale—Steel Wire—

Single Loop . . . . . 85½&10%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White . . . . . 20@20&5%

Haying—

Myers' Hay Tools 50%

Ice Tools—

Gifford-Wood Co. 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools . . . . 35&5%
Simond's Improved 33⅓%
Simonds' Crescent 30%

Ship—

L. & I. J. White 25%

Torches—

Hammers, Engine, ℔ doz. $4.50

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@1.25; gro. . . . $11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida . . . . . 75@10%
Newhouse . . . . . 50&5%
Hawley & Norton . . . . . 65&10%
Victor . . . . . 75@75&10%
Oneida Community Jump . . . . . 70&5%
Stop Thief 60%
Tree Trap 60%
Hector . . . . . 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine), ℔ doz.:

	Crate lots.	Small lots.
No. 1, Rat	$11.50	$14.50
No. 3, Rat	$5.75	$6.50
No. 3½, Rat	$4.70	$5.25
No. 5, Mouse	$2.25	$3.00

Animal Trap Co.:
Out o' Sight, Mouse, ℔ doz. $0.60
Out o' Sight, Rat, ℔ doz. 1.20
Easy Set, Mouse, ℔ doz. 35
Easy Set, Rat, ℔ doz. 85
Out o' Sight Chockers, ℔ doz. holes 12
Out o' Sight, Tin, 5-hole, ℔ doz. traps 75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in bulk, net ℔ gro. $5.50
In 1 doz. boxes . . . . . ℔ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern . . . . . 50&10%
Western Pattern . . . . . 60&10%
Handy Trucks . . . . . ℔ doz. $16.00
Grocery . . . . . ℔ doz $15.00
McKinney Trucks . . . . . each, net $10.00
Model Stove Trucks . . . . . ℔ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No. 0	1	2	3
Galvanized	$67	$79	$89	$99

10&7½&5&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls . 21@23¢
No. 12, ¼ and ½-lb. Balls . 19@21¢
No. 18, ¼ and ½-lb. Balls . 16@18¢
No. 24, ¼ and ½ -lb. Balls . 15½@17½¢
No. 36, ¼ and ½-lb. Balls . 15@17¢
Chalk Line, Cotton ¼-lb. Balls . . . . . 24@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. . . . . 8½@19¢
Cotton Wrapping, 5 Balls to lb., according to quality . . 13½@19¢
American 2-Ply Hemp, ¼ and ½-lb. Balls . . . . . 12½@15¢
American 3-Ply Hemp, 1-lb. balls . . . . . 13½@16¢
India 2-Ply Hemp, ¼ and ¼-lb. Balls (Spring Twine) . . 7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7¼@9¢
India 3-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls . . . . . 9@11¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 26½ Mattress, ¼ and ½ lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply . . . . B 6¢; A 7½¢

Vises—

Solid Box . . . . . 50&5@50&10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., 40&5%:
Slide 65%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00.
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists' 40%
Hollands':
Machinists' . . . . . 40@40&5%
Keystone . . . . . 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Parallel Bar 15%
Perfect, 15%; Lightning Grip 15%
Merrill's 25%
Millers Falls Oval Slide Pattern . 60&10%
Parker's:
Victor, 20@25%; Regulars . . . . 20@25%
Vulcan's . . . . . 40@45%
Combination Pipe . . . . . 55@60%
Prentiss . . . . . 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ℔ doz. . . . $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers' 60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe 70%
Holland's Combination Pipe . . 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads— *Price per M.*

B. E., 11 up . . . . . 60¢
B. E., 9 and 10 . . . . . 70¢
B. E., 8 . . . . . 80¢
B. E., 7 . . . . . 80¢
P. E., 11 up $1.00
P. E., 9 and 10 . . . . . 1.25
P. E., 8 . . . . . 1.50
P. E., 7 . . . . . 1.50
Dis. 15%
Ely's B. E., 11 and larger . $1.70@1.75
Ely's P. E., 12 to 20 . . . . $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled . . . . . 45&10%
Ground . . . . . 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs . . . . . $2.75@3.00
White Enameled Ware:
Maslin Kettles . . . . . 65&10%
Covered Wares:
Tinned and Turned . . . . . 35&10%
Enameled . . . . . 45&10%

See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
El-an-ge . . . . . 60&10%
Iron Clad Ware . . . . . 70&10%
Lava and Volcanic, Enameled . . 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles . . . . . 65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles . . . . . 65&5%
Solid Steel Kettles . . . . . 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone . . . . 40@40&10%

Washboards—

No.	℔ doz.
830—Brass King, Single Surface, Open Back	$2.80
862—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
737—Jewel, Single Zinc, Pail Size	$1.25

Washers—Leather, Axle—

Solid . . . . . 90@90&10%
Patent . . . . . 90@90&5%
Coil: ⅞ 1 1¼ 1¼ inch.
9¢ 10¢ 11¢ 14¢ per box.

Iron or Steel—

Size bolt . . . 5-16 ⅜ ½ ⅝ ¾
Washers . . . $4.65 3.75 2.45 2.25 2.05

The above prices are based on $6.75 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ℔ 100 lb. discount; in 100 lb kegs add 10¢ net ℔ 100 lb; in 5 or 10 lb boxes, add 50¢ net ℔ 100 lb; in 1 lb boxes, add $1.00 net ℔ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish . . . . . lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. . . . . 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District . . . . . $20.00@—
Western and Central Districts . . . . . $19.00@$21.00

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 . . . . . 72&10&7½%
10 to 18 . . . . . 72½&10&10%
19 to 26 . . . . . 75&10&10&2½%
27 to 36 . . . . . 77½&10&7½%
Galvanized:
6 to 9 . . . . . 72½&10%
10 to 14 . . . . . 72½&10&5%
15 to 16 . . . . . 72½&10&5%
17 to 18 . . . . . 72½%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 65&10&10%
Coppered:
6 to 9 . . . . . 65&10&10%
10 to 14 . . . . . 70&10&5%
15 to 18 . . . . . 65&10&10&10%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 72½&10&2½%
Tinned:
6 to 18 . . . . . 67&10&10%
Brass . . . . . 15½¢ lb., base
Copper . . . . . 15¼¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned . 75@75&10%
Brass and Copper . . . . 70@70&10%
Retailers' Assortments, per box, $1.90@$2.10

Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods . 90&40@90&40&10%
Brass Wire Goods, 90&40@90&40&10%
Brass Cup and Shoulder Hooks, 85&10%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&2½@80&7½%
Painted Screen Cloth, 100 ft. . $1.35
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural, 80&10&5@80&10&10%
Alligator or Crocodile . 70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S . . . . . 45@45&5%
Acme . . . . . 60&10%
Alligator Pattern, 70%; Bull Dog . 70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut . . . . . 50&5%
Combination Black . . . . . 50&5%
Merrick Pattern . . . . . 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl. . 40&10&5&5%
Coes' Genuine Steel Hdl. . 40&10&5&5%
Coes' Genuine Key Model . 40&10&5&5%
Coes' Genuine Hammer Handle . . . . . 40&10&5&5%
Coes' "Mechanics'" . . 40&10&10&5&5%
Donohue's Engineer . . . . . 40&10%
Eagle 70%
Gem Pocket 50%
Hercules 70%
W. & B. Machinist:
Case lots . . . . . 50&10%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots . . . . . 40&10&5%
Solid Handles, P., S. & W. 50&10%; full cases . . . . . 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain 50%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle . . . . 40&10&5%
Other Wrenches 50%
Vulcan and Acrippa Chain 50%
Whitaker Machinists' . . . . . 50&10%
Wizard Adjustable Ratchet 50%

Fruit Jar—

Beni. P. Forbes, Triumph, ℔ gro., $7.50; per doz $0.90

Wrought Goods—

Staples, Hooks, &c., list March 17, '08 . . . . . 90@—%

Zinc— (*Cask lots at mill.*)

Sheet . . . . . per 100 lb., $7.00

For the Table of "Current Metal Prices" see the First Issue of Every Month.